MONEY

FACTUAL READING

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MONEY

BY

WILLIAM ATHERTON DU PUY

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INTRODUCTION

It is a strange thing that so little of the actual, physical story of money has been written.

Whole alcoves in libraries are full of books on the theory of money. They argue without end over such questions as the gold and silver standard, over what should be back of the money that is issued, over measures to control its purchasing power, over inflation, credit.

But none of them goes back to the beginning, tells the story of money as it came down through the ages, shows how it developed into its present form, pictures it as it is to-day. None of them tells the physical story of this thing which has much to do with the lives of men.

And so people know little about their money. Who knows, for instance, that money started with copper pots? Who knows that the first shilling was a fragment of a broken ring taken by the victors in battle from the arms of those whom they had slain? Who knows why the United States based its currency on the old pieces-of-eight of the pirate stories instead of the shillings and pounds of the mother country? Who knows how and why it came to pass that he can go to the bank and get five kinds of ten-dollar bills? Who knows why there are enough silver dollars laid away in the treasure vaults of the government to load a freight train three miles long?

There is no book in the Congressional Library in Washington which in an orderly way presents the facts with relation to the concrete development of the various forms of money with which we come into daily contact.

I have worked long in getting these facts together and in attempting to make available the wonderful and romantic story of how this master tool came to the hand of man. In doing so I hope I have rendered a service. I hope I have made it easy for whosoever is curious to get a ready understanding of this money which occupies so much of the attention of most people.

WILLIAM ATHERTON DU PUY

MONEY

CHAPTER I

THE BEGINNING OF MONEY

THERE was a time when there was no money in all the world. There was none in the western world three thousand years ago. Then the people of Europe lived as simply as did the American Indians when white men first crossed the Atlantic. They had not learned how to use money.

Money seems a very simple thing to the peoples of to-day, but some one had to work out the idea of it in the beginning. At the time it was invented there was little travel and no such thing as reading. It therefore took an idea a long time to find a place in the minds of the people. Things moved slowly.

When the American colonies declared their independence from England and established their own government there was not a mile of railroad in the United States. Later, railroads were shown to be very useful and soon they were everywhere. They have made the world a different place from what it was in Washington's time.

Money was an even bigger idea than railroads. It is probably the most useful tool ever developed by

THIS IS A COPPER COIN OF CERTAIN NATIVES OF THE INTERIOR OF AFRICA AND USED TO BE VALUED AT ONE SLAVE

man. But, born early into the world, it has come slowly into use.

There was a time, for example, when the Greeks learned to make pots out of copper. That was a great discovery and marked an important step toward the modern way of living. People who had pots were far ahead of those who did not have them.

Everybody wanted pots. Those who had more of them than they needed brought them to the market places. There was no buying and selling in those moneyless days. The people in the market places merely exchanged one thing for another. They bartered with one another.

The potters offered their wares for barter. They found that other people in the market were always willing to exchange their goats, rugs, or whatever they had, for pots. There was an odd thing about these pots. They would exchange for almost anything. These pots themselves came in a way to serve the purpose of money.

At about this time the mind of some smart young Greek who owned much copper was seized with an idea. Instead of making this copper into pots he would make it into strips. He would barter the strips, and the people getting them could make their own pots. He called these strips *obols*. They may have been six inches long and the width of a man's thumb. Anyway it is set down that it took six of them to make a handful.

This Greek soon found that he could exchange these strips of copper for goats or rugs. He could barter them for fruit or cloth. He could even get pots for them. In fact, there were few people in the market who would not exchange whatever was in

IN THE OLD DAYS OXEN WERE MONEY. A SUIT OF ARMOR MIGHT BE WORTH 20 OXEN

their stalls for these strips of copper. Everybody wanted strips of copper. This man had, in fact, done the most wonderful thing of his time. He had invented money for his people. These obols were money.

Three thousand years ago Italy, soon to become a great nation, had not learned the secret of money.

The Italians fed their flocks on the hillsides. They bartered in their markets. The nearest thing they had to money was their flocks. The oxen and the sheep were things that everybody wanted and so came to be used as money. The ox was the bigger coin and was worth ten sheep.

Knights bought armor with oxen. A plain but strong suit of armor could be had for ten oxen. The fighting man who wanted to make a greater show of wealth, who wanted armor of a fancier sort, might pay as much as fifty oxen for it.

In larger deals this use of live stock for money served the purpose quite well. If, however, the housewife wanted a kettle of fish or a basket of kale, she was likely to find herself in trouble because there was no small change. Even in the big purchases there was trouble in passing this live money from one owner to another. One could not put an ox in his pocket. It was not easy, either, to put it away for safe keeping. It might walk away in the night. It had to be fed. Oxen and sheep did not serve the purpose of money very well.

A little later the Italians learned the Greek secret of using bars of copper when they went to market. This made business so much easier to carry on that a great change came about. The first Italian coin was called the *as*, and contained a pound of copper. The use of metals was just then developing and everybody wanted copper. Wherever the *as* was

presented it bought whatever was offered. It was easy to transfer from one to another. It cost nothing to keep it. It could be divided into small amounts and thereby used for the smaller purchases. It was so much better than oxen for money that oxen were no longer used.

SHEEP WERE SMALL CHANGE WHEN OXEN WERE MONEY

The change that the use of copper as money brought about is not hard to understand. If a peasant brought a goose to market and wanted a pair of sandals, he no longer had to search out another person who had a pair of sandals and wanted a goose. He sold his goose for copper and with the copper bought sandals. Italy had learned to use this new tool, money. The discovery had much to

do with the development that led up to the glory that was to come.

But copper did not go on without end as the metal from which the coin of Italy was made. It came to be used as money because it was a material that everybody wanted; it kept well; it could be divided into small amounts. At the time it suited the purpose better than any other metal. Copper was much handier as money than oxen. It was, however, a very awkward money compared with the kinds that were to come later. The *as*, which might be compared with the modern dollar, weighed a pound. If a dealer went out to make a hundred dollars worth of purchases, he would need to take a donkey along to bear the burden of his money.

At this stage of money development silver began to appear. It had all the virtues of copper but was more precious. Money made of it would serve the same purpose as that made of copper and would be much lighter. Silver was therefore a better metal from which to make coin than was copper. For a time the two metals were used just as gold and silver are now used. In the end, however, silver crowded out copper. It came into general use as coin about two hundred years before the time of Julius Cæsar and was the chief metal used for money for two thousand years thereafter. The great Roman Empire used silver money. Silver money paid for fighting the Crusades. Columbus bought his ships and supplies

with silver. Silver was the chief money used during the time that the American colonies were growing up in the wilderness.

But all the time another precious metal had been making its bid for use as money. Gold had been trying to take the place of silver just as silver had crowded out the ancient copper coin. During the last two hundred years it has almost succeeded in doing so.

When the Italians began using the *as* for money, it was an actual pound of copper. Human nature was about the same then as it is now, however, and some one soon thought of making his *as* a little lighter, not enough to be noticed, and still using it as though it were a full pound. Soon everybody was making the *as* lighter. Each generation made it still lighter until it came to weigh but a quarter of a pound.

In England the *pound sterling* in which the British measure their money, just as we measure ours in dollars, began by being an actual pound of silver. The English then put less and less silver into their money *pound* until it came to be but one-eighth the weight of the actual pound that it was in the beginning.

People also learned to mix other and cheaper metals with those that were used for money. They mixed, for example, lead with silver, and copper with gold. These two practices, of course, spoiled the simple scheme of early times of using these metals for money because of their actual value in metal. They

were no longer honest money. Anybody who accepted them had, in the first place, to weigh them, and in the second place, to find out how nearly pure they were. Doing these things was so much trouble

ROMAN COINS OF THE FIRST CENTURY AFTER CHRIST

that the value of these metals as money was almost destroyed.

In the earlier use of metals as money anybody who chose could hammer out the pieces of it that he took to market. Because of the frauds of short weight

and mixture with cheaper metals, governments found that they must take charge of making the money the people used. They must make the money honest if trade was to be made easy. The nation that made trade easiest had the best chance to grow strong.

So the governments took charge of such matters as manufacturing the *as* or the *pound* that was to be used as money. They set the standard for the amount of metal each should contain and the amount of cheaper metal that might be mixed with it. The governments took charge of stamping out these pieces of metal. They put marks on them to show how much metal was in them and how pure it was. Thus the first coins were made by governments.

As the nations developed, the more precious metals took the place of the cheaper ones. This was largely because purchases and sales grew always larger. Modern trades are so big that it would be foolish to think of payments being made in copper or even in silver. Imagine buying a skyscraper or a railroad and paying for it in copper!

Gold is now the chief standard for money in the world. Silver is still used, but it plays a small part in comparison to gold. It is used for small buying and selling, for the purchase of pins and needles, onions and potatoes. Whenever large transactions present themselves, whenever men sell their estates, women their jewels, yellow gold, or paper representing it, is the handmaiden that comes to serve them.

CHAPTER II

KINDS OF MONEY

AN object to be used for money must be something that everybody wants for one reason or another. If everybody wants a thing its owner can easily barter it for whatever he wants. It becomes money.

There are certain things that are very hard to barter. Here might be, for example, a man who had lost his left leg. He might own a pair of shoes, but, having only one foot, could wear only the right shoe. If there were no money he would go to the market place to barter his unused shoe. His task would be hard because there are few men who have lost their right legs. There are still fewer who have lost their right legs and who, in addition, wear the same size shoe as this man who has lost his left leg. This shoe is a poor thing with which to barter. It would be hard to find a worse object to try to use as money.

Yet this man finds another who has a left-handed pair of scissors. He exchanges his right shoe for these left-handed scissors because, he figures, there are more people who might use the scissors than the shoe. They should be easier to exchange.

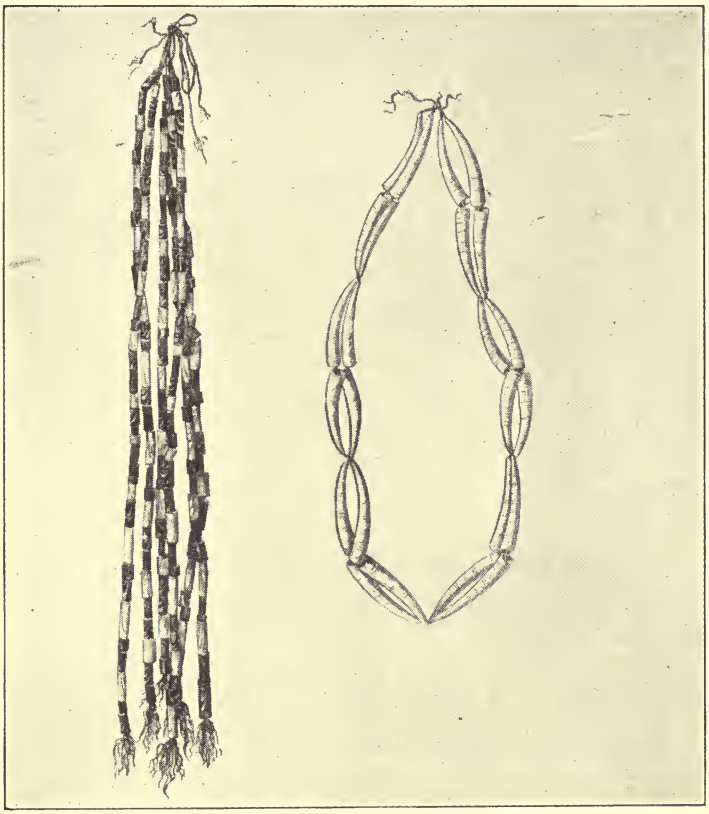
Then he finds a left-handed man and barters the scissors to him for a hatchet. This is a good trade for the one-legged man because either a right-handed or left-handed person can use the hatchet. There is a wider demand for it than for left-handed pairs of scissors. He is making progress toward getting an object that everybody wants and which, therefore, can be used as money.

Now this barterer exchanges the hatchet to a hunter for a mallard duck, prime and fat, which the latter has just brought in from the marshes. Tomorrow is to be a feast day and the market for ducks should be good. Many people will want ducks. They will be easy to exchange.

Finally this man exchanges his duck for a flask of gunpowder. This is the deal that marks his final success. In a pioneer community like this in which he lives everybody wants gunpowder. The supply of it is small. The demand is large. He has finally converted his left shoe, which almost nobody would want, into an article which everybody wants, and which he can exchange for anything he needs. This gunpowder will serve the purpose of money.

This general demand for certain things has led to many odd objects being used as money in different parts of the world. When men from Europe first came to America, for example, they found that the Indians were just developing the idea of money. They were making for their uses a sort of money

which made it possible for them to get away from barter. They used, in their buying and selling, wampum made of cockle shells. Out toward the east end of Long Island they had found great beds of cockle shells that would polish into black and glisten-



THE WAMPUM OR SHELL MONEY OF THE AMERICAN INDIANS

ing pieces. Here they had built up a mint just as we now have in Philadelphia. Here they came from far and near to make wampum with which to buy. They took great care with the form and polish of each piece, for was not this wampum strung into armlets and necklaces to be worn as a proof of wealth?

The early colonists had little money and so were forced to engage in barter. Their dealings were mostly with the Indians. At some trading posts glass beads and bright strips of cloth came to be used as money because they were always in demand. In the long run, however, the wampum of the Indians was found to be the handiest thing at hand and it came to be used as money by the settlers in both Massachusetts and New Amsterdam.

The white settlers, however, soon found that they could go to the cockle-shell beds of Long Island and, with their better tools, make great quantities of this money. They did this and soon it was so plentiful that nobody placed any value on it. One could no longer buy with it in the market. The settlers had debased, had spoiled, the Indian money by making too much of it.

The colonists, not having enough English money for their buying and selling, used various objects as money at various times and places. In Virginia tobacco came to be used as money. It was a thing which everybody wanted because every pound could be sent back to Europe and sold or exchanged for

goods. In Virginia, in 1619, taxes or debts could by law be paid in tobacco at the rate of three shillings a pound. Later the Hudson Bay Colony made a business of hunting wild animals in the far north for their furs. Skins of these animals became the money of that region.

THE STONE MONEY OF YAP STANDS BEFORE THE HOUSES OF ITS OWNERS AS A PROOF OF THEIR WEALTH. IT IS SO HEAVY THAT THERE IS NO DANGER OF ITS BEING STOLEN

In many parts of the world different objects have served the purpose of money. On the Island of Yap, in the South Seas, a very peculiar stone money is to be found. The natives of this island do little buying or selling since their food, drink, and clothes grow on the trees all about. Their chief use for money is in mak-

ing a show of wealth. The stone money of these islanders does this very well. A single piece of it may be in the form of a disk four feet across and weighing hundreds of pounds. It takes a great deal of work to make this stone into the form of a disk. Usually a hole is chipped through it which calls for yet more work. No man can own a piece of this stone money unless he can hire the workers it takes to carve it and bring it to his home. Only a rich man can do this. Once he has got his stone money, he puts it in front of his house where, being too heavy to be stolen, it remains, proving to his neighbors that he is a man of wealth.

These different sorts of money were used in different places and at different times because they came nearer meeting the money needs of each group than anything else that came to hand. Whenever a better money was found it was used. When the colonists could get English *pounds* and *shillings* they used them. It happened, however, that Spanish *dollars* were more plentiful in America than was English money, were handier for the Colonists, and so came to be used more than the money of England.

CHAPTER III

THE QUALITIES OF MONEY

AN object to be used as money must prove that it serves that purpose better than any other object. It must meet the competition of all other things in the world. That which best serves the purpose will finally come to be generally used.

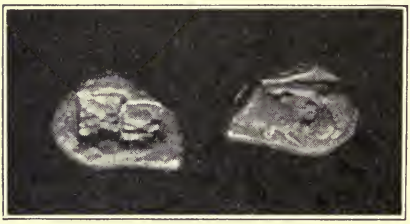
There are a number of qualities that a material must have to hold its place as money in the modern civilized world. It must, as has been said, be something that everybody wants. Gold and silver have been desired by everybody for thousands of years. Nothing has been in steadier demand. Tastes and fashions have changed in most matters but not as regards man's liking for gold and silver.

To be sure there have been other things that man has always wanted. He has always wanted water and food. He would have died without these, while he could have lived without gold and silver. But water and food lacked other qualities that a material must have to be used as money.

The student of the history of money is likely to notice soon that the materials from which money is made or which are used as money are likely to be more ornamental than useful. Beads, wampum, and stone

money were not useful but showy. So, when a metal found its way into general use as coin, it was not iron or copper, which are useful, but silver and gold, which are ornamental.

Silver and gold, among early Europeans, and among savage peoples in many parts of the world, were first used in making ornaments and later were used as money. They were bright, beautiful metals that did not rust or corrode. In America, before the Europeans came, the Aztecs of Mexico and the Incas of Peru had built up stores of gold and silver. Abraham, in Bible days, wore earrings of gold.



Coins of Crœsus

When the blonde hordes with blue eyes, the Goths and the Norsemen, came out of the North and overran Europe, they wore gold and silver arm bands and rings which were highly prized. These bands and rings were often broken up and used as money. The Norsemen had a ring breaker who was their first treasury official. They called one of the pieces into which an arm band might be broken a *schillingas*, and it is from this word that the English got their word *shilling*.

Ornaments were, in fact, the first savings banks. Simple men, saving wealth, put it into ornaments

which they or their women wore. The East Indian still does this and often cannot be led to use the Englishman's bank. Americans of to-day are working on the same idea when they buy diamonds which are quite useless. A study of the lives of men and women through the ages shows that their greatest efforts have not been to get those things which they actually needed. They have worked hardest for those things, such as ornaments, that they could have done without, but which would set them ahead of their fellows. To-day one often buys a new suit of clothes not because the old one no longer keeps him warm, but because it looks shabby.

The idea of putting wealth into ornaments was used by churches, nobles, even governments, all through the Middle Ages. Much of it took the form of gold and silver plate, which was treasured in monasteries and castles. Savings went into silver and sometimes into gold and these were put, for keeping, into plate. The goldsmith followed the ringbreaker as the money man. In his time he came nearer serving as banker than did any other person. An example of his handiwork and of the practices of the Middle Ages was seen when the German Emperor visited the King of England at the beginning of the present century. On that occasion ten million dollars worth of this plate, made in earlier times, was displayed at Windsor Castle.

It might not be strictly correct to say that a

material to come into use as money must be ornamental. It is a historical fact, however, that such materials have nearly always been ornamental. The fact that they could be used as ornaments has been a great aid to their coming into use as money.

Roman Gold Coins

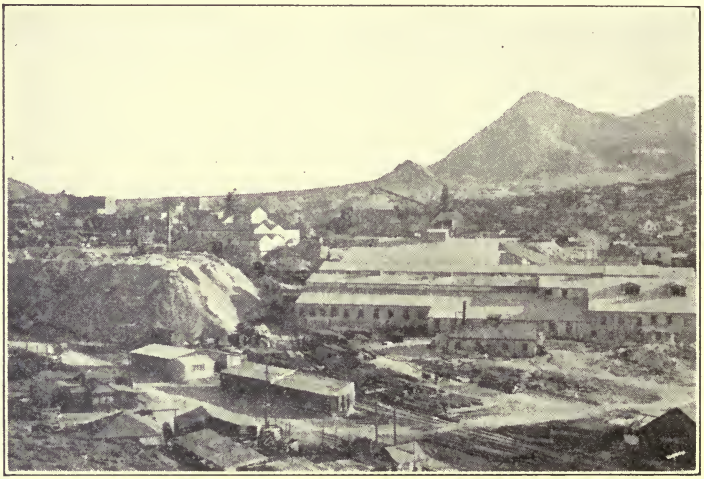
There are other qualities, however, that may certainly be set down as necessary. An object to be used as money, for example, must last, must be durable. Money is often put away for months or years.

To serve this purpose it must not rust, decay, age, evaporate, or in any way change. Skins or tobacco did not have this quality. Even iron rusts. Gold and silver, exposed to the weather or buried in the ground, will keep without change for thousands of years. They need no protection, no painting. They suffer no change through the ages. They meet the need of durability as do few substances in the world.

If an object, a material, or substance is to be used as money, it must be possible to divide it into suitable pieces. Beaver skins fail again because the big ones, worth a dollar, cannot, without injury, be cut up into little ones worth a dime. Even if they were they could not be put back together again afterward. Diamonds are valuable but they cannot be cut into bits and put back together afterward. The metals proved to be handier as money than other materials. They were divisible.

Among the metals which man learned to use as civilization developed, gold and silver were found to be easy of use for coinage because they were somewhat soft and easy to work. Gold and silver are the two most workable metals. Had they been as hard as iron they would not have suited as well. Yet their chances would have been poor if they had been as soft as lead. They have competed with other metals and their degree of hardness has been shown to fit them well for use as coin and ornament.

Then there is another quality which is akin to workability that they must have. They must have "homogeneity." This means that they must be the same throughout. If one cuts through a piece of bread he finds it is not the same all the way through. It is likely to be dry and hard at the outside and soft



A Region Rich in Gold, Tonopah, Nevada

and damp in the middle. One end of a brick, if it is examined carefully, may be found to have more clay and less sand than the other end. Different bricks are different. Gold and silver, however, are always the same and the same through and through.

Then gold and silver have always had another quality without which they could not have come into use. They have not been too plentiful. They have

always been quite rare and hard to get. If they had not been scarce they would have been so cheap that nobody would have wanted them. Iron, for example, is more useful than gold, but there is so much of it, and it is so easy to get, that it could not possibly be used as money.

Gold and silver have been scarce, but not too scarce. There has not been enough of them to make them cheap and yet there has been enough for use as money and ornaments.

Being scarce gives them another quality that money must have. They are precious, and it therefore does not take a great deal of them to be worth a large sum. They are what we call "portable." They can be carried from place to place. A man may sell his farm for gold and move to another state and carry the money with him. If he sold it for iron money, however, he would get such a load of it that he could not carry it away. It would not be portable. It is too plentiful and cheap. It takes too much of it to have given value.

Then there is yet another quality that the material of which money is made must have. It must change little in value from year to year. It should be of the same value all the time. No material goes along at the same value through the centuries, but gold and silver have come nearer doing so than any other.

As the need for money became greater with the growth of business, man tried out as money all the

objects in the market place. Gold and silver finally came into general use because they served the purpose better than anything else. They are not perfect for that purpose. Their greatest fault lies in the fact that they do change in value. Gold is undoubtedly cheaper now than it was half a century ago, but not so much cheaper as to upset values. Gold and silver have fought the battle with all their rivals, however, and have won. They have the fine qualities of a metal that may be used as money. They are very ornamental, durable, divisible, homogeneous, and scarce. They are the best substances for use as money that the world has so far developed.

CHAPTER IV

PURPOSE OF MONEY

IF one wants to buy cloth he speaks of it in yards. It is in yards that cloth is measured. If one talks of liquids, such as gasoline for running automobiles, he speaks of gallons as the measure. But if he is thinking of values, of what this or that is worth, it is money that becomes the measure.

One automobile costs one thousand dollars while another is priced at three thousand dollars. Dollars are the measure. One man's pay is twenty dollars a week, while that of another is fifty dollars a week. Dollars measure the value of the services of these two men. One book may cost twenty cents and another two dollars; one pencil may cost one cent and another ten cents. Everywhere money is the measure of value.

In ancient times the values of suits of armor were measured in oxen. Servants were bought in early Virginia and paid for in tobacco. But wherever there is money it is the measure. Whatever is for sale, be it a paper of pins or a line of steamships, is priced in money. One of the simplest, but at the same time most important, purposes of money is to serve as a

measure of value. It is the yardstick by which most things are measured. That may be set down as its first purpose.

From this we pass to the second purpose of money — its use as a common denominator into which all things that are bought and sold can be changed.

One does not go far in a study of fractions until he finds that he needs to add together some such simple parts of a whole as one-half and one-third. He may be surprised at first to find that these two numbers cannot be summed up as can two plus three and the answer written down.

He finds, however, that other people in this world ahead of him have wanted to add these fractions and have worked out a way. They have learned how to find a common denominator for fractions. Change one-half and one-third into three-sixths and two-sixths, with a common denominator, and they can be added or subtracted. They can be compared, the one with the other, to see which is larger.

In the same way one might find himself to be the owner of a cow, a sheep, and a pig. He might want to add them all together to see what they are worth. He would reduce them to dollars which is the common denominator. It might happen, also, that he was not a farmer, but a carpenter. He would like to change his live stock into saws and hammers. He would want to know how many saws and hammers he could get for them.

Here again he would find that he could change saws and hammers into this same common denominator — dollars. His cow was worth $20, his sheep $10, his pig $5. He would add them all together and would

THIS IS SMALL CHANGE IN THE STONE MONEY OF THE NATIVES OF THE ISLAND OF YAP

have $35. Saws, he might find, were worth $2, while hammers were worth $1. He might buy ten saws and fifteen hammers. It was all quite easy with money as a common denominator. Money has served a second purpose.

The third purpose of money is its use in changing one object into another. Man uses it to change whatever he has into whatever he wants. Money does a thing that is surprisingly like this. Money changes wheat into houses, land into ships, cattle into jewels, work into food. It is magic. It can change anything in the world that is of money value into anything else that its owner wants and that can be bought.

One may have silk. It has value. But the owner of this silk is hungry. He cannot eat silk. What he wants is a beefsteak. The silk can always be sold for money and money will always buy beefsteak. A scheme has been worked out, through the intelligence of man, that keeps a magic power always at everybody's elbow. Money performs the miracle. It converts, changes one thing into another.

But as a converter money can do much more wonderful things than this. A person may seem not to have anything in this world that can be sold. He stands ragged with only his bare hands. He may want one of the hardest things there is to get, an education. Money may be able to perform even this miracle for him.

He still has one thing that he may sell, his time and the labor of those two hands. He can work for wages and thereby change this time into money. He can so use that money as to convert it into an education.

SHELL AND STONE MONEY FOUND IN THE MOUND DWELLINGS OF AMERICA

Without money it would be impossible to run a shoe factory. Workmen could not be paid for very long in shoes. They would not be able to buy food. Without money it would be impossible for a government to exist. Imagine the United States government collecting its taxes in the different products of the people! If all the coal mines brought a part of their output down to the Treasury in Washington, think of the confusion that would result. It might come at the same time that five per cent of the cotton from the South and five per cent of the wheat from the West arrived. Five per cent of the lumber might be standing on the sidings. Five per cent of the pigs might be squealing in the yards, and five per cent of the ducks quacking in a quite crowded Potomac River. Withal, Washington would not be the quiet and beautiful capital it is to-day.

Money is, in fact, the one master tool of the ages, without which it would have been impossible for the world to have developed far beyond that stage of simple life which was so general before money came into being.

Yet money in itself is of little account. It is not the money itself that is so highly prized. Its value lies in the uses to which it can be put. It is because it is the master tool of the ages that it has become so important a thing in the world.

Nobody eats money. It is not used as clothing. It cannot shelter, warm, or amuse one. It is a dead,

dull thing, except as it serves its purpose as a measure, a go-between, a converter.

Every civilized human being uses money, or it is used for him, many times every day. It is busy all the time changing what he has for what he wants. It is his greatest aid in the modern world. Yet it is only metal or paper, of little value in itself.

Getting this money scheme so arranged that it would work just right has been no small task. It does not yet work to perfection anywhere in the world. It probably works better in the United States and Switzerland than anywhere else. Many nations are still having trouble with their money systems and their people are suffering as a result. Getting money systems right and keeping them right is one of the most important purposes of governments.

CHAPTER V

THE STORY OF GOLD

GOVERNMENT scientists examine the gizzards of birds to find out what their owners have been eating. If they eat wheat or corn it is likely that they have stolen it from the farmer. They are set down as being hurtful to the farmer. If they eat grasshoppers which injure crops, they are helpful. In this way the government finds which birds are the farmer's friends and which his foes.

But sometimes these scientists find strange things in the gizzards they examine. There was, for example, the gizzard of a duck killed in Arkansas. Imagine the surprise when three gold nuggets were found in it!

Many birds eat gravel, which stays in their gizzards to help grind up their food. This duck had been picking gravel somewhere in the north from whence it had come, and the gold nuggets had been so thick in that gravel that three of them were found in the gizzard of the ducks. If that gravel bed could be traced, it is likely that one of the richest gold mines in the world would be discovered.

Finding gold in this way calls to mind an odd thing about this precious metal. It shows that it is found

pure in its natural state. This is true of almost no other metal. Iron is found as iron oxide, which is the red earth one may see along the roadside. Copper, silver, and nickel are found tied up with other things in chemical combinations. Chemistry must be called

Washing Gold out of Sand in the Bed of a Stream

in to separate them. Gold, as stated above, is found pure and free. It lies among the gravel as nuggets, in the sand as yellow dust. It is found in solid rock, quartz, or veins. Streaks of pure gold run through this quartz.

Gold was among the first of all the metals to be

used by man. This was because it was free in nature. Some savage in the long ago must have found a golden pebble, must have put it on one rock and struck it with another. He found that the yellow pebble did not fly into pieces as do most pebbles. It flattened out. It could be hammered into one shape and another. Thus the difference between rock and metal was discovered. So a way was found to work gold. Trinkets were made of it. It was a beautiful metal. It was used for ornament long before money was invented.

It is interesting to know that savage people in many parts of the world learned to work gold and to prize it highly. Explorers found an Egyptian king in the interior of Africa who sat on a golden stool as a throne. The Australian bushmen, when their continent was first discovered, had golden arrowheads. The American Indians had golden ornaments. The Aztecs of Mexico and the Incas of Peru had hoards of gold, which were taken from them by the Spaniards. In Bible times kings built up treasures of gold. These were gathered into the temples. These hoards became the chief spoils of war in early times.

Gold, however, was at that time little used as money. There was not enough of it to serve this purpose. In the meantime early man, having learned something of metal-working through gold, found out how to extract copper from its ore. Copper was much more plentiful than gold. It was

first the pot metal and then money for the people. It was the first metal money. It became too plentiful, too cheap, and silver took its place two or three hundred years before Cæsar's time.

Silver was the chief money of the world for nearly two thousand years. Europe used it all the time in the climb toward civilization. Charlemagne, the great French emperor of the eighth century, made a pound of silver the money standard of Europe. In French to this day "argent" means money — all money. The real meaning of the word, however, is "silver."

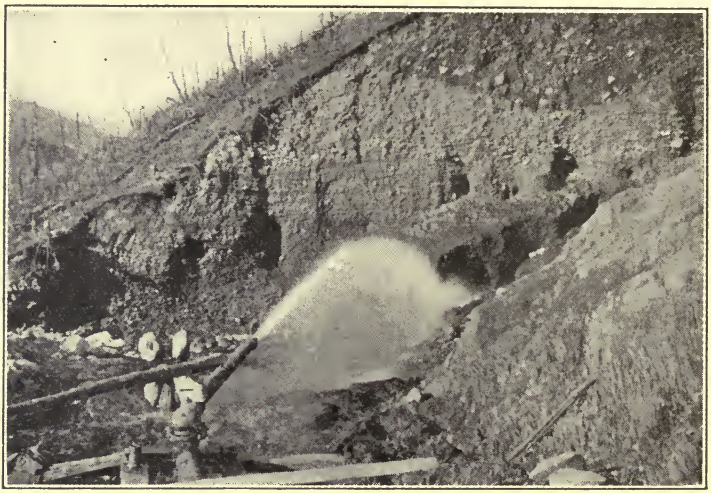
At the time of Columbus there was a great shortage of money in the world. The age when rivers of gold would flow from the mines of the world had not yet come. Gold was still scarce. Paper money had not come into use. There was little but silver and not enough of that. The progress of the world was being held back because of a lack of money.

The Spaniards found silver mines in Mexico rich beyond their dreams. This silver went to Europe and was made into money. There were actual shiploads of it. It helped the world to go forward, for it made it possible to do many things that could not have been done without large amounts of money. Yet even this increase in the amount of money in the world was but a hint of what was to come.

Gold had been prized above all else during all this time. It could not serve so big a purpose as that of

being used as money for the nations, however, because there was not enough of it.

The swing of the world from silver money to gold money has taken place during the last hundred years. Up to the year 1800 all the people and all the nations taken together had piled up but about three hundred million dollars in gold. The United States alone



WASHING DOWN A BANK THAT THE GOLD MAY BE TAKEN FROM IT AS THE WATER RUNS AWAY. THE GOLD BEING HEAVY DROPS INTO POCKETS PROVIDED FOR THE PURPOSE

now has more than ten times that much. So the world was really poor in gold for a long time after the government of the United States had been established.

Gold in large amounts is a very new thing in the world. A hundred years ago the mines of the world

were turning out only about eight million dollars a year in gold. Of late, since 1906 in fact, they have been yielding around four hundred million dollars a year. More gold is being produced each year now than existed in the possession of man a hundred years ago.

The greatest of dates in the history of gold is 1848. It was during that year that a man named James Marshall picked up a lump of gold in the mill race of Sutter's sawmill in El Dorado County, California. The pioneers of that state then began to hunt gold. They found it here and there. Word of the richness of the discoveries spread all around the world. People went gold mad. From everywhere they came to the West in a wild hunt for gold.

It was but three years later that two gold hunters in far-away Australia scraped up three pounds of gold dust from the bed of a stream in a single day. Not long after that another very wonderful thing happened in Australia. Two nuggets of pure gold were found that were the biggest nuggets that the world has ever known. Each of them weighed one hundred eighty pounds. The wild rush to Australia was like that to California. All around the world gold hunting became the rage. The yellow metal was found in many places. In a little while gold was coming from the mines ten times as fast as it had ever come before.

Then, in 1890, another event took place which

Statue of James W. Marshall, Who Discovered Gold in Sutter's Mill Race in California in 1848

marked the second step in the great outpouring of gold that was to be the feature of the twenty years that followed that date. Gold had been discovered in the Transvaal, which is in South Africa. Among the hardy spirits who went down there was an

Englishman named Forrest and a Scotchman named MacArthur. These two men worked together in their gold mining. As they worked they used their heads and the result was that they found a new way to get gold out of ore. Their method is called the *cyanide process*. By that process the gold that is in the ore

GOLD SECURED BY THE DREDGING METHOD. SAND IS RUN THROUGH THIS DREDGE WHICH TAKES UP THE GOLD FROM THE SAND

is dissolved out of it by a chemical. The chemical is then made to give up the gold.

By this process money could be made from working ore that was not good enough to pay under the old methods. What had before been considered poor ores now became rich. Gold could be taken from many new mines that could not have been worked

before. It is probably true that, since the world began, nobody has ever worked out a scheme for doing another simple thing that has made so much money. Yet, strangely, the names of these discoverers are not known to many people.

Here is the way the output of gold grew in the years that followed. In 1890 the output was $113,000,000; in 1895 it was $198,000,000; in 1900 it was $235,000,000; in 1905 it was $380,000,000; and in 1910, $454,000,000. The yearly output has stayed around $400,000,000 a year ever since.

As a result of this increase of output, when this century was about ten years old, there were six billions of dollars worth of gold in the possession of man. A scant hundred years earlier there had been but three hundred million dollars worth, one-twentieth as much. About this time, also, the United States of America possessed a billion dollars worth of actual gold, the first such hoard ever brought together beneath the sun.

CHAPTER VI

THE PURPOSE OF GOLD

PEOPLE are used to thinking of gold in small amounts, as in jewelry or in coins. There is not often a reason for measuring gold by tons, by train loads. When one comes to consider gold in the masses in which it is held in the treasure vaults of nations, however, it begins to stack up like wheat in a warehouse.

It takes two hundred seventy-one dollars worth of gold to weigh a pound. A thousand dollars worth of it would weigh about three and three-quarters pounds. Ten thousand dollars in gold weighs thirty-six or thirty-seven pounds. To be exact, a million dollars in gold weighs 3,685.7 pounds. This is nearly two tons — a good two-horse wagon load.

In about 1900 there was in the United States a billion dollars worth of gold that was used for money purposes. It was either in the United States Treasury or in the banks or the pockets of the people, where it was being used as money.

From the figures above it is easy to work out the weight of this billion dollars worth of gold and we find that we have 3,685,700 pounds of pure gold.

It would take a thousand teams hitched to two-horse wagons to haul this gold. There would be 1,841 tons of it. The railroad people say that forty tons is more than an average load for a freight car. Figuring a load as forty tons there would be some forty-six freight carloads of gold in a billion dollars. It would take a freight train nearly half a mile long to haul this gold. One sometimes sees a train as long as this, pulled by a huge iron monster belching fire, out on the marshes of New Jersey, or plunging through the prairies of the Middle West, or the lonesome wastes of the mountains. It would take six such trains, three miles of loaded cars, to haul the gold that was produced in the world during the twenty years that came just before the World War.

There is a standard price for gold. That price is $20.67 an ounce. The government will buy all the gold that is brought to it at that price. So will nearly all the other governments of the world. This means, of course, that gold need never sell for less than that price.

But here is an odd thing about the way the United States government deals in gold. It will sell gold at the same price at which it buys it. Anybody who wants gold can go to the Treasury and get all of it for which he is able to pay. The price will always be $20.67 an ounce.

This free buying or selling is what is called an "open

gold market." The other nations, unless they are having money troubles, keep open gold markets.

The price of gold was the same when the Treasury of the United States was established in 1792. It has been the same ever since. It is the same in London, in Tokio, in Buenos Aires, everywhere.

GOLD MINE AT TONOPAH, NEVADA

The nations want to keep the price of gold always the same. They do not want the value of their money to change. They want a hundred dollars to-day to be worth just the same as it was ten years ago and just the same as it will be ten years from now.

Why do they want this? Because it is a great help to business. If a man buys a house for $15,000, for instance, he may pay $5,000 in cash and give a

mortgage on the house for $10,000. He may not pay that mortgage for ten years. Both he and the man who sold him the house must have some assurance that the $10,000 is going to have the same value ten years ahead or they cannot make such a business arrangement.

So the treasuries of all the nations have kept out a sign which reads, "Gold bought at $20.67 an ounce." Whoever got gold out of the mine could sell it to any of the governments. He could not sell it for more anywhere else because the governments would sell at that price. The gold flowed to the treasure vaults of the nations. They were the natural markets for gold.

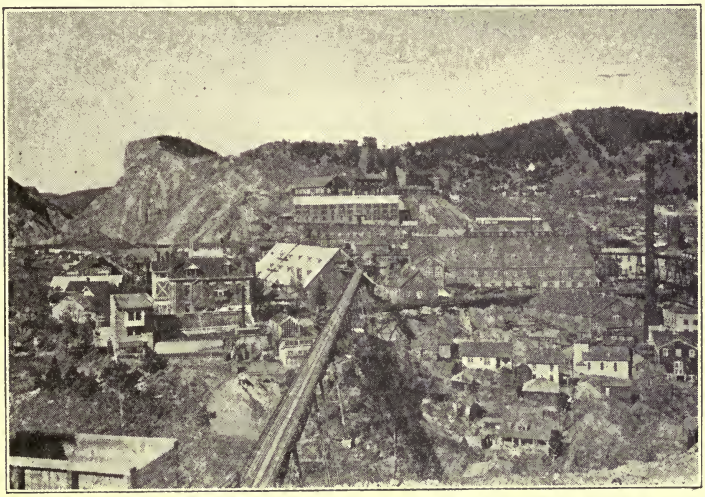
And the gold did a great good in the world. It made possible a growth in business and industry that was the wonder of the past generation.

Consider Belgium, for example. Before the mines began to pour out gold it had but a limited amount of money. It might want to develop its colonies, build steamship lines, establish factories, but without large amounts of money these big undertakings were impossible.

So Belgium, and all the other countries, wanted to get gold. When they got it they made it up into coin and put it out among the people. As the amount of it grew, more business could be handled. Industry and development went ahead rapidly.

There has been no period in the history of the world in which industrial and commercial develop-

ment has gone forward so fast as since the outpouring of gold beginning in 1849. An urge for doing new and always bigger things has swept the world. Continents have been cut apart by such work as the Panama Canal. Tunnels have been driven beneath rivers and mountain ranges. Buildings of huge size



A Rich Gold Mine, the Homestake Mine at Lead, South Dakota

and great height have been put up. Industries like that of automobile making have come into being.

There is reason to believe that such undertakings would have been impossible had there not been at hand much of this handy tool, money.

With the building up of stores of gold the nations gradually found out how to properly use paper as

money. They found, for example, that they could put the gold away and issue slips of paper which stood for it. People holding these slips of paper could go to the Treasury, if they wanted to, and get the gold. They knew that there was gold back of this paper. The paper was handier to carry about than the gold, so they never went after the gold. The way to make paper money good is to have gold back of it.

The yellow-backed bills that one often sees in the United States are actual receipts for gold in the Treasury.

Putting actual gold back of paper money is the only way to make it as good as gold. When a nation does this its money is on a gold basis. When a nation has no gold back of its paper that paper is likely to lose value. After the World War many of the nations of Europe found themselves short of gold. Some of their money went down until it was half its former value, some to one-fourth its former value, and some of it became quite worthless.

The nations found, however, that it was not always necessary to put a dollar in gold back of every dollar in paper money. They found that they might put four million dollars in the Treasury and issue ten million dollars in paper against it. It was still redeemable in gold. Anybody who wanted gold for his paper could get it. Keeping forty per cent of gold back of it was all that was necessary.

Issuing money on this basis made the gold go two and a half times as far. It made it possible for a nation to put out two and a half times as much paper on a given amount of gold. It made the handy

Sluicing Gold from Surface Sand and Gravel

money tool more plentiful. It made business easier to carry on.

This seems to be about the basis to which the nations are coming. They are going to a gold basis and are finding that they can keep their paper money

good if they can keep something like forty cents in gold back of every paper dollar.

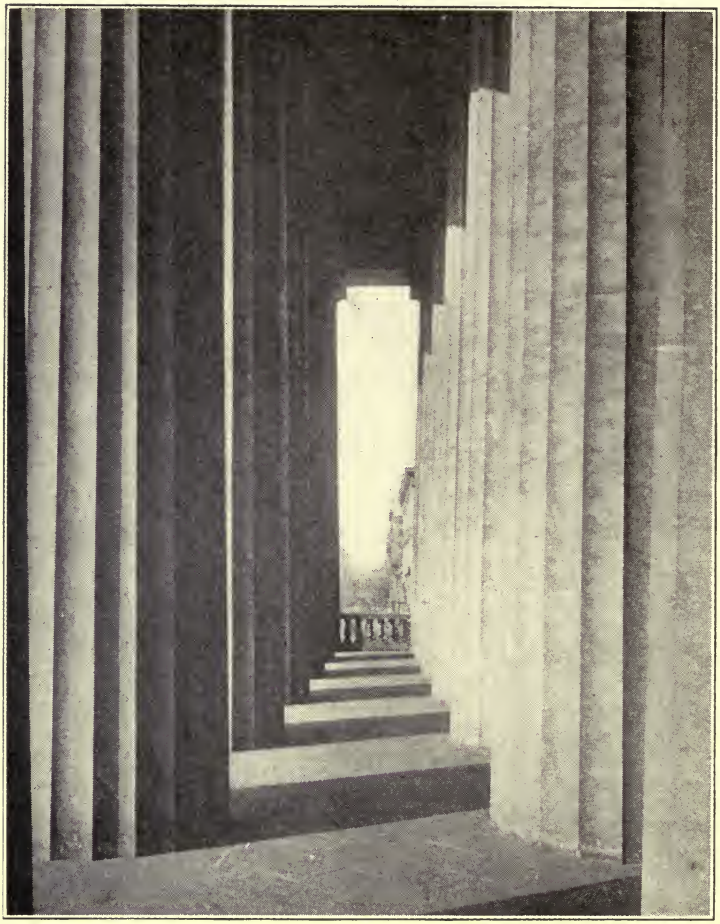
Gold is coming more and more to be accepted as the world's standard of value. If one wants to know what Chinese money, Mexican money, or Persian money is worth, he figures out how much of it is needed to be worth an ounce of gold. Then it is easy to change it into dollars at $20.67 an ounce. Gold is the standard everywhere.

CHAPTER VII

WHEN GOLD GOES VISITING

THE proper resting place for gold is in the treasure vaults of the nations. Nearly all of the treasuries, as has been said, buy gold whenever it is brought to them. They always pay the same price, $20.67 an ounce. Gold is never worth more, for these treasuries will always sell at the same price. So, whoever digs gold out of the ground takes it to the nearest treasury and gets money for it. The gold stays there and the government puts out paper money, holding the gold as a pledge that the paper is good.

In the spring and early summer of 1914, however, the year in which the World War broke out, bankers and government officials in New York began to notice that a very strange thing was happening to treasury gold. It was on the move. It was being bought in large quantities and shipped to Europe. Altogether, during the three months before the war came, seventy million dollars — one hundred twenty-five tons of it — had been shipped abroad. It came to be no uncommon thing to see motor trucks guarded by men with guns across their knees hauling this gold down to the docks.



TREASURY DEPARTMENT, WASHINGTON, D. C.

Never before had there been such an awakening of this sleeping gold. The Assay Office, which is the government's gold storehouse in New York, soon found its supply of the yellow metal was about to be exhausted.

The Treasury Department in Washington found it necessary to take quick action. One night it sent a trusted official over to Philadelphia on a secret mission. He was to go to the Mint there, was to get twenty million dollars in twenty-dollar gold pieces, and was to load it into a freight car and take it over to New York. This was to keep the Assay Office there from running out of gold.

This man had to unload the precious gold on the New Jersey side of the river. He borrowed some twenty mail wagons from the postmaster in New York and hustled the gold into them. He put them on a ferry-boat and crossed the river. He drove them through the narrow streets of lower New York, nobody suspecting the wealth that was passing. This official in charge, however, says that his mind was by no means easy, for he kept thinking that here, probably, was the richest prize that had ever been out in the open, where bandits might have a chance to get it, since the world began.

The remarkable thing about this buying of gold at that time was that it showed that somebody in Europe knew that the war was coming. Somebody was piling up gold, for hoards of it are of great importance

when nations are at grips. When there is trouble, credit may be destroyed, paper money may become worthless, and gold may be the only thing with which one can buy. Somebody knew the time of trouble was coming and was getting ready for it.

After the war had been going on for a while, however, the flow of gold started in the other direction. The nations of Europe were buying great quantities of war supplies in the United States and they often had to pay for them in part at least in gold. They had to go into their treasure vaults and arouse their sleeping gold.

By 1916 enough gold had crossed the Atlantic to make up the second billion dollars worth of it in this country. It was thought at the time to be a very marvelous thing that one nation should have two billion dollars in gold in its possession.

The war went on, however, and the nations were forced to borrow and buy more and more from this country. They had to send over more gold. In another year another billion dollars worth of it had come. We had three billions in gold. There was but nine billions in gold used for money purposes in all the world. One nation had a third of it.

Yet this was not the end. After the war was over the nations of Europe were without supplies and the United States had plenty of them. Those nations had clung to as much of their gold as they could, and now they dug it up, brought it to America,

and bought the raw materials they needed to get started again. By 1923 they had sent over another billion. The great young nation of the West had four billion dollars in its coffers. Still the yellow

In a Treasury Gold Vault

metal came. It reached its high tide in 1924. The United States then had four and a half billion dollars in gold. This one nation had half of the gold used for money purposes in all the world.

We have already made a measure of a billion

dollars in gold. It would weigh 1,841 tons and would load a freight train half a mile long. This four and a half billions would weigh more than eight thousand tons. It would load a freight train more than two miles long. This one nation had that much actual gold in 1924. It would take one hundred sixty thousand men, each with a hundred-pound sack of it on his shoulder, to carry this gold.

When the war was over the United States was the only important nation in the world that was properly on a gold basis. The treasuries of most of the nations of Europe had pretty well run out of gold. The paper money of some of them came to have no value at all, while that of others was worth one-fourth or one-tenth what it had been when there was gold back of it.

For a time there was talk of finding something else to put back of money to make it good. There was much looking about for something to take the place of gold. If it could have been found, the great gold hoards of the United States might have become next to worthless.

But the people of the world were used to thinking of gold as the proper measure of value. The new countries that were established, such as Latvia and Lithuania, on the Baltic, scraped together what gold they could get and began putting out paper money with this gold back of it. This paper money held its value.

Countries like Austria and Hungary were taken under the wing of the stronger nations. They were granted loans. They got gold together and issued new paper money on it. The other nations that were in trouble watched these experiments. The idea of getting back to a gold basis grew stronger with them.

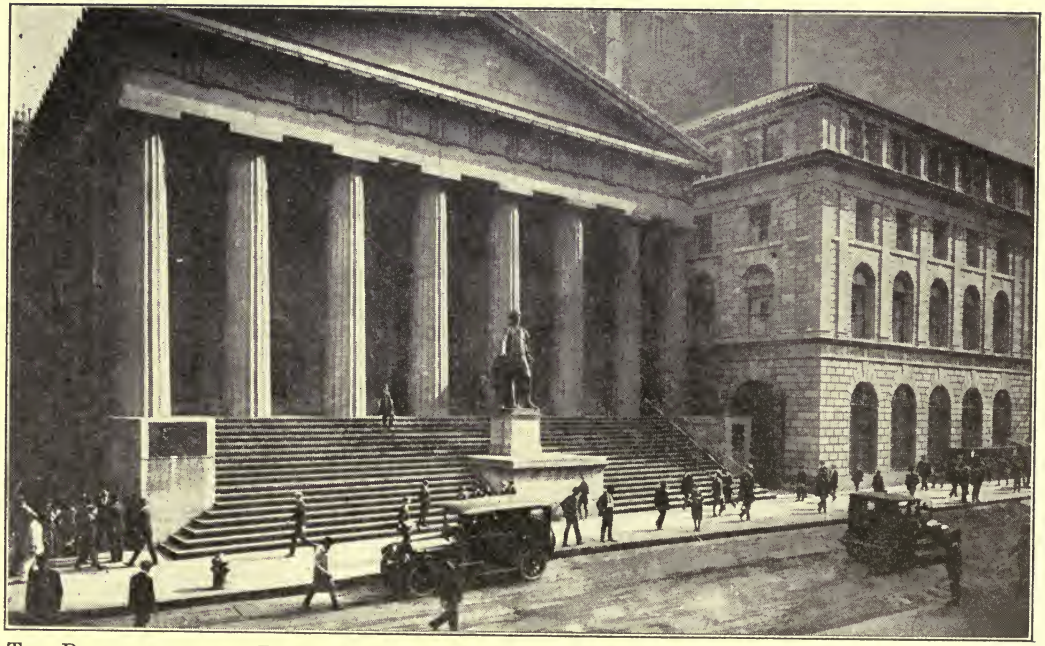
The old paper money of Poland, for instance, was almost worthless. The Poles threw it away and started a new money system with a unit called the "zloty." They kept gold back of the zloty and it gave them a sound money.

The Dawes plan gave Germany a bank that could issue paper money with gold back of it. It proved to be good money.

One after another the nations, after the war, went back to the gold standard. They came to think even more of it than they had before because they had tried to find other ways to make money good and had failed.

It now looks as though gold would hold its place for a long time to come as the best thing of value for the governments to hold in their treasuries to guarantee their paper money. It looks as though it might come to be used by practically all the peoples of the world.

Used in this way it becomes the common denominator to which all moneys can be reduced. One can figure the money of any country in the world into



THE BUILDING AT THE RIGHT IS THE GOVERNMENT ASSAY OFFICE IN WALL STREET BENEATH WHICH RESTS THE GREATEST GOLD STORE IN THE WORLD. AT THE LEFT IS THE HISTORIC OLD CUSTOMS BUILDING ON THE STEPS OF WHICH WASHINGTON TOOK THE OATH AS PRESIDENT. ALL ITS BASEMENTS ARE FILLED WITH BAGS OF SILVER DOLLARS

gold and then figure that gold into the money of any other country. If one has ten thousand Japanese yen, for example, and knows how many yen are worth an ounce of gold, it is easy to figure how much gold his money is worth. Then he can figure his gold into dollars by multiplying the number of ounces by $20.67, or into English pounds by multiplying by the number of pounds in an ounce, or into francs by multiplying by the number of francs in an ounce. Any money can be figured into gold and from gold into any other sort of money. Gold is called the common denominator of money.

CHAPTER VIII

THE GOLD SHOP OF THE WORLD

ENDLESS throngs of hurrying feet turn from Broadway into Wall Street where old Trinity Church keeps watch toward the end of Manhattan Island. This Wall Street is the financial center for all America and these hurrying feet carry the active brains that have to do with most of the big undertakings of the nation. They do not, in fact, stop with the borders of the United States. It is here that the plans may be made and the money found for steamship lines that girdle the world, for harnessing waterfalls that give power to needy nations of Europe, for opening mines that will awaken some out-of-the-way corner of the earth that otherwise might sleep forever.

Not far from the narrow throat of this wonderful Wall Street, which history tells us was once a cow-path, there stands a straight modest building that looks out through severe barred windows. The throngs hurrying past pay little attention to it. Almost nobody seems to be going in or out. If one does stop to look he gets a peculiar impression of serenity, of quietude. A watchman sits in a doorway

that is little used. The furnishings of some sort of workshop show through the grated windows. Figures may be seen moving about in the blue shirts of workmen. It seems strange that so plain a shop should be housed in this busy street.

Yet this quiet building is none other than gold headquarters for all the world. It is the New York Assay Office, a branch of the Treasury Department in Washington.

Almost all the gold that has flowed back and forth between Europe and the United States since the time when the World War broke out has passed through this single gateway. It was here that the nations sent their gold that they might buy guns and explosives and food for the armies when the great conflict was at its height. It was here, when the war was over, that they sent for gold that they might get their factories going again, that they might get back to stable money.

This office has received more gold in this generation than has any other one place in the world. It has melted that gold, tested it, stored it, taken care of it, shipped it again to the nations of the world that wanted to buy. It has, in fact, handled more gold than any other ten offices in the world. Most of the gold of all the world that has started moving about has come this way. This somber building in Wall Street is the "homing" place of gold, where it waits for its call to service.

The government has other assay offices at such points as Denver, San Francisco, Seattle, and Philadelphia. The chief business of these assay offices is to test the gold that is offered for sale. In normal times the gold comes out of the mines and is brought to these government offices because the government is always ready to buy gold. Before it buys, however, it must test the gold to find how nearly pure it is. The assay offices do this testing.

Before the war, such offices as that at Denver or San Francisco, being nearer the mines, were more important than was the New York office. They bought more gold. But when the nations of Europe began the war and needed supplies they were forced to ship their gold to America to pay for them. The gold usually came in stout boxes to New York banks. The banks were not able to judge its value so they sent it to the Assay Office. There, whatever its form, it was melted down, tested, and $20.67 in United States money was paid for each ounce of pure gold.

It is the policy of the government to buy all gold presented in quantities greater in value than one hundred dollars. The customer may be the government of France and the amount may be fifty million dollars. Again, the customer may be a burglar who has robbed a house and has melted the jewelry he has found into a dirty lump of impure gold. Many men come to the Assay Office with such quantities of gold. Those in charge may be very suspicious of

their customer but they refine his gold and pay him for it just as though it were a shipment from a great nation overseas.

All the gold is given the same treatment. It may be English gold sovereigns, or bullion from Mexico, or golden idols from the Orient. In every case the metal is put into a retort, set over a very hot fire, and melted until it may be stirred with a ladle as might be so much broth for dinner. The idea in stirring it is to make sure that it is so mixed that the potful will be the same throughout.

Finally the molten gold is dipped out with ladles and poured into molds. When it cools it is gold bars. The assayers now chip samples off of these gold bars and test them to find out how nearly pure they are. The sovereigns from England are likely to have some copper in them to harden the coins so they will not wear easily. The bullion from Mexico, when it comes from the mines, usually has silver in it. If it is found that one of these samples weighing one hundred ounces is ninety per cent pure gold, there will, of course, be ninety ounces of gold in it. To find the value of the shipment the ninety ounces is multiplied by $20.67 which is the value of an ounce.

After the value of any shipment is found and it is paid for, the Assay Office proceeds to separate the metals that are in it from each other. It takes out the copper, the silver, the platinum, the gold.

The shops in which these metals are worked look

much like the shops in other industrial plants. Despite the fact that they are here on Wall Street they are grimy, smoky, and filled with many odors.

There is one outstanding difference between these and other shops — the care that must be taken that none of the precious metals get away. In the melting room there is gold in the smoke. This smoke is not allowed to pass off as is other smoke. It is, in fact, first run into special chimneys for treatment. Wires are placed in these chimneys and electric currents are sent through them. This causes all the fine particles that are in the smoke to get positive or negative charges of electricity and to be let down as soot. This soot is then collected, worked over, refined, and the result is that much gold is taken out of it.

There was a time in the San Francisco mint when no attention was paid to the sweepings from its floors. Then one man thought that there might be gold in them and saved them. It is said that he made a fortune from them.

Now the government takes care of the sweepings from all of its mints and assay offices. It brushes down the walls and takes the gold out of the dustings. The men who work in these shops must bathe each night before they leave the building. The water which cleanses them is treated to recover the gold that is washed off their bodies. They must change their clothes before they go out and those in which

they work are washed and the gold is taken out of the dirty water. When clothes are worn out they are burned and the ashes are treated to recover the gold in them. Altogether, some sixty thousand dollars a year is recovered in this way at the New York Assay Office.

Some of the gold bought at this Assay Office becomes stock on the shelves of a modest store that it runs from which it sells gold to anybody who wants to buy it for industrial use, for such purposes as making jewelry. This office, however, will sell only in quantities of five thousand dollars or more. It is not interested in small sales. Persons who want gold in smaller amounts must hunt up a gold broker and buy from him.

The gold store at this office is not more than ten feet long and six feet wide. It has plain, unpainted, board shelves. Its wares are displayed on these shelves. They are bars of gold. Some of them are big bars worth six thousand dollars to eight thousand dollars. The smallest of them are slim little bars worth no more than three hundred dollars. Here the users of gold come to buy. This tiny store does a business of sixty million dollars a year.

The vaults of this Assay Office were empty when, in 1914, a railway carload of gold was hurried over from Philadelphia. All through the war and for years afterwards, however, the gold of the world flowed into New York and came here for melting.

Some of it was distributed to other treasure houses, some of it went into circulation as money, but much of it stayed right here. The Director of the Mint, in his annual report of 1924, stated that there was then in this one treasure house $2,297,000,000 worth of gold.

Before the war the greatest store of gold in the world under one roof was about six hundred million dollars in the treasury of Russia. The treasury of France had nearly as much. The United States had more gold than that but it was scattered about. The greatest single store of it under one roof was in the Denver Mint. There was five hundred million dollars worth of it there.

Here in this modest building in Wall Street, five years after the war, was to be found four times as much gold as had been in the possession of great Russia in the days of the Czar. There was five times as much of it as had been in the Denver treasure house before the war. Neither Great Britain nor Germany, in the prosperous days before the war, had more than one-tenth this amount of gold. It was such a store of gold as had never before been even approached since time began. It was four times as great as any store that had ever been laid up anywhere. It was such a monument to the vast wealth of a nation as had never before been seen in the history of the world.

It was a rare experience to be taken into these

treasure vaults of gold in the days when they were full to bursting. Five stories underground they extended, imbedded in the solid rock that lies under Manhattan Island. They have walls of inconceivable thickness and strength. These walls are so filled with wires charged with electricity that gongs would begin to sound the moment they were attacked. The door to these vaults weighs sixty tons, yet it is so delicately swung that it can be moved on its hinges by pushing against it with two fingers.

Back of the door the vaults are built, one below the other. One takes an inside elevator and goes down. The last is the master vault. It sits on the solid rock and so it makes no difference how great is the weight it carries. Because of the strength of its floor as much gold as it would hold had been put into it.

One stands at the foot of the elevator shaft and looks out on a sea of gold. The room was some twenty-five feet wide and sixty feet long. The gold in it was in bars a little wider and a little flatter than bricks. So heavy is pure gold that one of these bricks weighed about twenty pounds. Each one of them was worth something like six thousand dollars.

In this room these golden bars were stacked in a pile eight feet high like so many bricks ready to be used for building. The whole room to that depth was a solid mass of gold. It gleamed and glistened as the light from the electric bulbs played upon it. This burnished gold is a thing of great beauty, of

light and shade and glow. There in its quiet home to which the clamor from without could not reach, it shone like a huge, radiant jewel in a somber setting.

There was more than eight hundred million dollars worth of it here in a single compartment. There was more gold in a single room than Russia or France had ever possessed. There was here in one vault as much gold as England, Germany, Austria-Hungary, and Italy combined had in their treasuries during those happy days before the war. This was the greatest mass of wealth that was ever brought together in one spot since time began.

Above this master vault was another just like it, bearing another great weight of gold but not piled quite so high. On the next floor up were tiers of smaller vaults, each with its particular kinds and sizes of gold bars.

Some purchaser might want gold with ten per cent of copper in it, or some might want gold in smaller bars. Various kinds of gold were kept ready for sale to various customers.

It is but natural that one should stop to wonder if there is any chance that robbers might ever get at this gold. When he thinks through the situation, however, he must realize that no undertaking would be more hopeless for any band of organized criminals than to attempt to get at this store of gold.

In the first place, the building is surrounded by more devices for its protection than is any other store

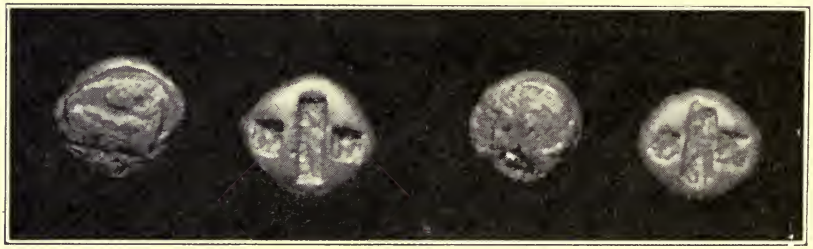
of treasure in the world. Any attempt to reach it would bring all the law enforcement agencies of a great city down on the outlaws. In the second place there is no reason why criminals should want to get at two billion dollars in gold. If a hundred men got into the vaults they could move only a small part of the gold if left alone for a whole day. To haul it all away would take a freight train a mile long and there are no tracks running into Wall Street. It would be more sensible to try to rob some more modest storehouse of gold with but one million dollars in it. One million dollars would weigh nearly two tons. It would take half a dozen men many hours to bring so much up from the vaults and put it on a truck. Working in close quarters like these, it would take all the men who could be mustered to the job a month to carry up the gold of the Assay Office and load it on the trucks. No gang of robbers could hope to be allowed to work for this length of time undisturbed in busy Wall Street. Gold is a thing that can be stolen only in rather small quantities. The big stores of it are too heavy to carry away. If they did steal such quantities of gold, to get value for it they must sell it back to the government, and our officials make it their business to know where large amounts of gold come from.

CHAPTER IX

THE MINTING OF THE COIN

THE first coin that actually deserved the name was in Lydia about two thousand six hundred years ago. Lydia was a city in Asia Minor in which most of the people were Greeks.

These first coins were made of electrum which is a mixture of silver and gold. They were very simple. They looked as though a few drops of melted metal



COINS OF LYDIA — FIRST COINS EVER MADE

had been poured out and a stamp pressed into the disk that formed, much as is done when one seals a letter with wax.

The idea of coin quickly spread to Greece. That country was just beginning to come into the day of its artistic glory. It was but natural that it should think of making these coins more beautiful. The

result was that in three hundred years the Greeks had developed coins the like of which have never been made anywhere else in all the centuries that have passed since then.

SOME OF THE EARLIEST COINS OF ATHENS—550 B.C.

The dies for these Greek coins were cut in metal by hand and the coins themselves were either molded in them or stamped with them. The art of these Greeks, not so greatly changed, is to-day being used at the mints of the United States.

There are three mints, one at San Francisco, one at Denver, and one at Philadelphia. This latter is the

COINS OF SYRACUSE, GREECE, MADE ABOUT 500 B.C., AMONG THE FIRST OF THE GREEK COINS

principal mint. It not only strikes the most coin but it makes the dies which the other mints use. This die making is the most interesting part of the whole process of minting the coin.

At Philadelphia one may start at the very beginning and follow through to the coin ready to go into the pockets of the people. He may see all the difficulties that must be overcome that trainloads of

By 400 B.C. Greece Had Developed These Beautiful Coins

coins may pour forth, each stamped with a most artistic design made in the beginning by some great artist like Saint Gaudens or Weinman.

It all starts with this design. The ancient Greeks had to cut their designs into the hard metal and when a die made in this way wore out they had to engrave another. It would have been impossible to make enough coins for the people of to-day in that way. But since that time many methods have been worked out for using machinery to meet the greater needs.

The artist no longer has to cut his design in metal. Instead he makes it of wax which is easy to work. First he makes a drawing of his design. Then he lays it out on a slate and builds up his design little by little just as a sculptor would work in clay.

This artist, for instance, may have been making the design of the eagle in flight which appears on the quarter dollar. It was easier for him to work on a

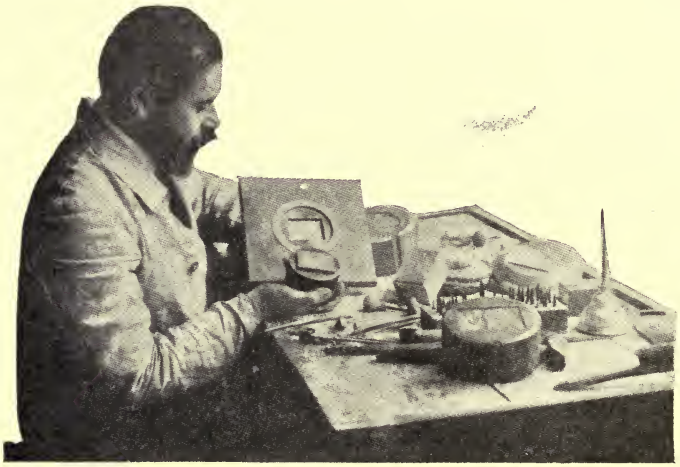
ROMAN SESTERTIUS OF 130 B.C.

design as big as a plate and he did so. One can imagine how much easier this was than if he had had to cut it out in steel the actual size of a quarter.

When this design in wax is done the artist's work is finished. The rest is to be worked out by modern science and machinery.

The first thing to do is to get the wax model into a firmer form. It cannot be molded into metal form, of course, because the hot metal would melt the wax. A cast of it can be taken in plaster that will soon

harden. This hardened plaster will stand heat. The plaster takes on the exact imprint of the wax except that the lines are below the surface instead of being raised. It is as though the wax were the foot and the plaster were the track it had made. But the track is the exact imprint of the foot.



AS THE METAL COMES FROM THE CAST

Then the next step is taken. The plaster cast is used as a mold and melted metal, copper perhaps, is poured over it. The result is a copper cast that is exactly like the wax model of the artist. The design is in relief. The lines are above the surface. The artist's work has now been made into a copper plate just the size in which he drew the design.

But a quarter dollar cannot be cast from this metal

sheet which is as big as a plate. A way must be found to shrink it until it is but an inch across.

It is here that a most interesting machine is used, a machine which was unknown to the mints of nations until it was invented by a Frenchman in 1840. It is a machine that will take this copper plate and reproduce it in the size of a quarter or in whatever size is wanted, without losing a single line.

This machine is built around the principle of a rod fastened in the middle and with a needle something like that used on a phonograph in each end of it. The needle on one end is blunt. It is intended to trace the face of the design on the copper plate, but without scratching it. The needle in the other end is sharp and hard. It is set against the face of a piece of steel. The machine is set going and the two needles go round and round as they would on a phonograph record.

The needle at the cutting end is guided by the needle that is tracing the design on the copper plate. It cuts into the steel an exact reproduction of what its fellow at the other end feels. The machine runs on for thirty or forty hours. At the end of that time it has transferred the design on the copper plate to the steel.

Now if the rod is fastened in the middle the face on the steel will be just the same size as that on the copper. The same amount of movement at one end of the rod will make the same amount of movement

THE MINT AT PHILADELPHIA WHICH, BEFORE THE WAR, HELD MOST OF THE NATION'S GOLD

at the other. If, however, the rod is fastened closer to the steel end, the movement will be less. The picture cut in the steel will be smaller. One can see just how this would work by taking a ruler in the middle, moving it back and forth, and measuring the distance traveled by each end. That distance will be the same in each case. He can then take it three-fourths of the way down, move it back and forth, and measure the distance traveled by each end. The

Roman Bronze Coin Showing Head of Emperor Augustus

short end, it will be found, moves less distance than the long end.

By changing the point at which the rod is fastened, this machine can be made to carve out in steel in whatever size is wanted the same picture that is in copper.

It is on this machine that all the artists' designs for the coins are reduced to the sizes in which they are wanted.

Yet even this design cut in steel is not the final die

from which the coins are struck. It is, however, the "hub" from which those dies are made. It is the mother of the dies.

There is yet one other process before the dies are ready for actually striking the coins.

This hub is first tempered, changed from soft steel to hard steel. This is done just as steel is hardened in the old-fashioned blacksmith shop. It is heated

EARLY COINS PECULIAR TO SOUTHERN ITALY

and then plunged into water. There is some magic in this sudden change from hot to cold that makes steel hard.

Then this hub goes on a most powerful press, one that can strike a blow of twenty tons. The face of this hub is to be driven against another bit of steel which is soft with that twenty tons back of it. It will flatten out that bit of steel. The blow will be struck time after time. Finally the impression is

complete and perfect. A die has been made. After hardening, this die can go on one of the coining machines and actually strike coin.

MEDALS OF THE PRESIDENTS MADE AT THE PHILADELPHIA MINT BY THE SAME METHOD THAT PRODUCES COIN

The preparation of these dies is one of the big jobs at the mint and the preparation of the metal for the coin is another. There are four kinds of this metal:

1. There is the metal which goes into the one-cent pieces. It is ninety-five per cent copper and five per cent tin and zinc. The addition of this tin and zinc makes a harder metal.

2. There is the metal that goes into the five-cent pieces, the nickels. This metal is not all nickel. It is not even mostly nickel. It is in fact twenty-five per cent nickel and seventy-five per cent copper. Nickel is a very hard metal. Copper is somewhat hard. This coin, with this combination of metals, is the hardest of American coins. It would be much harder if it were pure nickel. This pure metal is, however, so hard that there is trouble in working it. The copper

is put in to soften it. The strange thing is that the mixture is not more the color of copper. The nickel seems to have the stronger character and dominates the mixture.

3. The third metal is that which goes into dimes, quarter dollars, half dollars, and dollars. They are styled silver coin. The metal of which they are made is in fact nine parts silver to one part copper. The copper is added to the silver to make the metal harder.

When Metal Takes an Artistic Design

4. Then there is the metal that goes into the five-dollar pieces, the ten-dollar pieces, and the twenty-dollar pieces. These coins are properly called half eagles, eagles, and double eagles. These coins are styled gold coin. Yet the metal that goes into them is but nine parts gold to one part copper. It is quite different in color from pure gold, is more like copper. As in the case of the silver, the copper is added to make the metal harder. Gold is a soft metal. Even the combination of gold and copper is somewhat soft and coins made of it lose weight with handling.

In the vaults beneath the mints there are huge stores of these metals. As they are needed they are taken out of these vaults and melted. The mixtures

are made in just the right proportions. This properly mixed metal is then run out in bars as wide and as thick as three fingers. It is then in proper form for testing and for further working.

These strips are rolled out to the proper degree of thinness for the coins into which they are to go. The strips for dimes must, of course, be thinner than the strips for dollars. Great care must be taken to get the strips the right degree of thickness.

When the thickness is just right the strips are run through punching machines. Disks are here cut out. There is a different size of disk for each coin. All the disks are smooth, clean, and shiny.

The disks now go to the coin machines. They are piled up in tubes that hold stacks of them. The machine starts going. At every impression it takes a disk off the bottom of the stack. It thrusts it in between the dies that have been so carefully prepared. The machine strikes. A mere piece of metal has been changed into a coin of the United States. It may go forth and serve its useful mission as money. It is a part of the plan of a nation to supply its people with a common denominator into which any other object of value can be converted. And keeping the people supplied with a stable money, it should be kept in mind, is one of the prime purposes of government.

CHAPTER X

PAPER MONEY

TWO hundred years before Columbus, the people of Europe did not even know that there was such a country as China. They had not yet found out that in the East there had been civilization and education for thousands of years before westerners had worked out a way of writing.

Then Marco Polo, a bold merchant of Venice, traveled overland by caravan to China. He lived there many years and returned with marvelous stories of what he had seen.

It might have been that few people would have known of these strange adventures if Marco Polo had not been put into prison. Venice and Genoa, where Columbus was born, were rival city kingdoms, one on each side of the peninsula of Italy. They went to war with each other because at that time they did not think there was enough trade in the world for two cities with ships. In this war Marco Polo, who commanded a ship of Venice, was captured.

He was thrown into a prison in Genoa, perhaps into the very prison in which the father of Columbus was later a watchman. With him in that prison was a

modest writing man of Piza, and this scribe put down on paper Marco Polo's marvelous stories of the East. In this way the greatest travel book of early times was written.

Among the strange things of which Marco Polo told was the fact that the Chinese used paper for money. He described one city after another by saying that its people worshiped idols and used paper

STATE BANK MONEY IN MASSACHUSETTS IN 1835. IT WAS THE ONLY PAPER MONEY IN CIRCULATION FOR TWENTY YEARS BEFORE THE CIVIL WAR

money. Instead of bartering with copper, silver, and gold, they printed money and made it serve the purpose of buying in the market.

Using paper for money looked so easy that Europeans soon began trying to do it. Though they have been trying ever since, few of them have made a complete success of the idea. Most of their efforts have been failures. The paper money of many of the countries of Europe, for instance, became next to worthless after the World War.

The United States, which has done better with its paper money than have many other countries, failed to make it serve its proper purpose all through the colonial days and even up to the time of the Civil War.

It should be borne in mind that any piece of paper money is nothing more than a promise to pay. It is a promise to pay just the same as a note that one man might give another is a promise to pay. The paper dollar in your pocket, with "silver certificate" printed on it, is a promise on the part of your government to pay you on demand one silver dollar. A yellow-backed, ten-dollar note is a promise to pay ten dollars in gold on demand. There is coin waiting in the Treasury to make good on these promises at any time. The United States government is the strongest and richest agency that exists in all the world. It puts gold or securities back of its paper money. The paper is therefore as good as gold. It is as good as gold because it can be changed to gold at any time.

Whether or not any promise to pay, like paper money, is as good as gold, depends on how sure the holder is that the maker of the promise will live up to it. The maker must not merely be honest and intend to pay but he must be able to pay. When governments have issued paper money, the people who received it have always asked themselves those two questions: Did the government intend to pay? Was it able to pay?

Very soon they were likely to present some of this money and actually find out if coin would be paid for it. If it was, they gradually came to have confidence in it. If the government showed for a long time that it would pay in gold, the paper money became as good as gold. No other method of making paper money as good as gold has ever been worked out anywhere in the world.

Whenever and wherever paper money cannot be changed for gold it loses value.

Before the war the paper money of European countries could be changed into gold. The French franc, the German mark, the Italian lire, the Swiss franc were, roughly, each worth twenty cents.

Shortly after the war only one of these countries, Switzerland, could redeem its paper money in gold. Its franc continued to be worth twenty cents. The French franc and the Italian lire went down by 1924 to about one-fourth their former value. This showed that the people's confidence in the willingness and ability of those countries to pay was about one-fourth what it had been before. The German mark was almost worthless because there was almost no chance of ever changing it into gold.

One of the biggest problems in the world is that of getting a money that will stay all the time at the same value. So far the best scheme that has been worked out is to put gold back of all money issued. This cannot always be done.

Nations usually get into trouble with their money in time of war. When the American colonies were fighting for their independence, they needed money very badly. Since there seemed to be no other way of getting it, the Continental Congress began printing

The United Colonies
No. 37965
SIX DOLLARS.
THIS Bill entitles the Bearer to receive SIX SPANISH MILLED DOLLARS, or the Value thereof in GOLD or SILVER, according to a Resolution of CONGRESS, passed at Philadelphia, Nov. 2, 1776.
PERSEVERANDO
SIX DOLLARS
Continental Currency
SIX DOLLARS

THE PAPER MONEY PUT OUT BY THE CONTINENTAL CONGRESS WHICH CAME TO BE "NOT WORTH A CONTINENTAL"

it and putting it out without gold or silver, which was then much used, back of it. These notes, like all paper money, were mere promises to pay. Since there was no gold or silver back of them, since the people did not even know whether or not the government would live, they were afraid of this paper

money. The more notes were issued the less became their value. In the end people came to say, and they still say, that anything that has no value at all is "not worth a continental." A "continental" was a note of the Continental Congress.

This paper that is not redeemable in coin is called "fiat" money. This means that it is money by command and not because it has any real value back of it. The issues of the Continental Congress were fiat money.

Before the Revolutionary War was over Robert Morris, a gentleman of wealth of Philadelphia, set up a bank which was good beyond question, because all its capital was in coin. It helped the colonies out of many tight places when money was greatly needed. It issued paper money that could be brought back to the bank and exchanged for gold or silver at any time. This money was soon as good as gold. Its success made plain to the fathers of our country that the proper way to put out paper money was to have coin back of it for which it might be exchanged at any time.

A little later the Bank of the United States was established. It put out paper money in the same way. It was not government currency, however, but money of the bank. The charter of this bank, when it expired in 1812, was not renewed. This left the country without the currency it needed just as the War of 1812 began. In 1814, as a result, there was

a panic and hard times. A second Bank of the United States was founded. It worked fairly well, issuing paper with coin back of it, but this bank also got into politics and was finally abolished by President Jackson in 1833.

All that was left was the state banks. They printed money and put it out, backed only by their promises to pay and sometimes by cash. Each state put out its own money. Almost none of this

Pennsylvania State Bank Money Issued in 1862

money was worth as much, dollar for dollar, as was coin. Some of it was worth seventy-five cents on the dollar and some of it was worth twenty-five cents on the dollar. Some of it came to be worth nothing at all.

Forty banks were started in Michigan which printed and put out money with the picture of a wildcat on it. Nearly all of them failed. They were merely schemes to make fortunes by printing money.

From that day to this, schemes to make money dishonestly are spoken of as "wildcatting."

For twenty years before the Civil War the issues of these state banks were the only paper money there was in the United States. The dollar of one state was not of the same value as the dollar of another state. If one traveled from one state to another he had to change into a different sort of money just as he does to-day when he passes from one country to another in Europe. All of this was very confusing and made business hard to carry on. People living to-day who have always had money of which there has been no question, and that has been good wherever they went, find it hard to realize that as late as 1860 the United States had not worked out a satisfactory currency system.

CHAPTER XI

THE ORIGIN OF THE DOLLAR

BUT some of this tale is getting a bit ahead of the money story as it has been worked out in the United States of America. The colonies which became the United States were, of course, British colonies. It would seem that they would have had shillings and pounds, which is the sort of money the British use. But they did not. They turned to dollars. How, one wonders, did this come about?

The story of the dollar goes back a long time and has quite an interesting beginning. The dollar, in the beginning, had a very long and awkward name. It was called a "Joachimsthaler."

The word "dollar" grew out of that very clumsy term. It all began in Joachimsthal, which was St. Joachim's dale, in Bohemia. In that dale, or valley, in 1516, rich deposits of silver were found. The mines were owned by the Count of Schlick. That gentleman, knowing very well the need of coin, caused a new one to be fashioned out of his silver. On it appeared the face of St. Joachim. The place in which it was made was Joachim's dale. It was called a Joachimsthaler.

This Joachimsthaler became an important coin in its day, for money was scarce. Its use spread westward into Germany. There the first part of the name was dropped and it became a thaler. That term was long used in that country. The thaler came on west, and in the Netherlands came to be called a daler. It was not necessary to change this name greatly when in English it became a dollar.

THE FIRST DOLLAR — THE JOACHIMSTHALER — COINED BY THE COUNT OF SCHLICK IN HUNGARY IN 1516

The terms "thaler" and "dollar" were applied to a good many coins in Europe in the sixteenth and seventeenth centuries. In Spain, which was becoming very important in the money world because of the silver it was getting from Mexico, the thaler was called a peso. The peso was also known as a piece-of-eight. These are the same pieces-of-eight of which one reads in the pirate stories. They were the

treasure most often taken by pirates in those days because Spanish money was more plentiful than any other.

England was very short of money. She did not have enough of it to carry on business at home. She was being held back, was being kept from becoming a powerful nation because she did not have money with which to build ships, open mines, and develop colonies. She had no money to spare to her American colonies. They could not get shillings and pounds. It was because of this that they were forced to use wampum, the shell coin of the Indians, in New England, tobacco in Virginia, and skins in the north, as money.

MEXICAN PIECES-OF-EIGHT OF A LATER PERIOD

Spain was in a more fortunate position because she had secured large quantities of gold, and even more silver, from Mexico and Peru. The mines of Mexico, in particular, were yielding shiploads of silver. Spain was making much of this into coin and selling more of it to other nations of Europe. No great amount of it, however, was going to England.

So Spain had much coin with which to do business

and England had little. Spain grew strong at that time while England's development was slower.

Early Pieces-of-Eight of Peru

Spanish money was plentiful on the American side of the Atlantic. Spain was very active toward the

The First American Dollar Looked Like This

south. She ruled nearly all of America. Nearly all of America south of the United States still speaks

Spanish. At the time of the Revolutionary War Florida, Texas, and all the land west of the Mississippi to the Pacific, were under the rule of the Spanish.

THE FRANKLIN CENT MADE IN 1787

Even in the English colonies Spanish money was much more plentiful than English money. The

FIRST ACTUAL COIN OF THE U. S. WAS THE ONE-CENT PIECE OF 1793

colonists were in the habit of using this Spanish money.

The most common Spanish silver coins were these

pieces-of-eight. A piece-of-eight was a thaler, a dollar. The Spanish said it was eight "reales." A "real" is a "bit," 12½ cents. There are still eight "bits" in a dollar. The Mexicans still say "dos reales" when they speak of 25 cents. In the southwest, citizens of the United States making a literal translation of the Spanish words say, "two bits," and "four bits."

The colonists used more pieces-of-eight than they used shillings. They found this Spanish money

First American Ten-Dollar Gold Piece

which was divided into units on the decimal system was handier than the English money. When they came to set up a money of their own they had as Secretary of the Treasury Alexander Hamilton, who was born and brought up in the West Indies and was accustomed to Spanish money. They adopted the decimal system. This act was of great historical importance, deserving more attention than is given it. It has been of great value to the United States.

This Spanish money was one of the easiest in the world in which to figure. The English, on the contrary, was one of the most awkward. This choice of Spanish money has saved the school children and the business people of the United States vast amounts of figuring that they would have had to do had they adopted English money.

CHAPTER XII

FOUR TYPES OF NOTES

THE people who use paper money little realize that there are five distinct kinds of it put out by the government of the United States. There are from three to six denominations of each of these kinds. There may be one-dollar bills, two-dollar bills, five-dollar bills, ten-dollar bills, twenty-dollar

EARLY AMERICAN DIME

bills. It is all very confusing. There are so many different kinds of money that people seldom come to understand about them. They little know why they are there or how they came about.

A man might go to the circus and buy his tickets out of a twenty-dollar bill. He might get a ten-

dollar bill in change. He might be suspicious of these circus people since they are here to-day and gone to-morrow. This ten-dollar bill might look strange to him. He might begin to wonder if it were a counterfeit.

This bill might have a picture of a buffalo on its face and the figure of a woman standing for "Enlightenment" on its back. The man who had it might

THE FIRST AMERICAN FIVE-DOLLAR GOLD PIECE

show it to a friend and ask him if he thought it was good. The friend might bring out, for purposes of comparison, a ten-dollar bill which he felt sure was all right since he has just received it from his bank. As he unfolded this bit of money the two might stand appalled, for these two bills are in no way alike. If the second one is a good ten-dollar bill, the first, it would seem, surely must be something else. This second note has on the front of it the picture of a

strange gentleman whose name seems to be Michael Hillegas, while the back of it is yellow.

Another friend might approach and be asked to show his ten-dollar bills, if any. He has one. Oddly it is nothing like either of these tens that have been under examination. On its face appears the benign countenance of Mr. William McKinley, who may be remembered as having once been President. There are ships on the back.

Much excited, these gentlemen might go to a drug store across the street and ask to see other ten-dollar bills. They might be shown one with the face of a man named Hendricks on it, and yet another with that of Andrew Jackson, who fought duels and whipped the British at New Orleans.

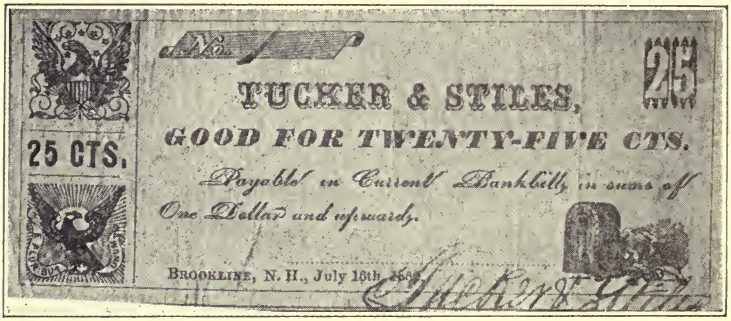
There seem to be a surprising number of different kinds of ten-dollar bills about. They are, as a matter of fact, all good. There are so many of them, however, that it is hard for one quite to make up his mind what to expect.

Three out of five of these types of paper money grew out of the Civil War. At the beginning of that war the government was almost without a currency system. It was in great need of money. This war had to be carried on or the nation would go to pieces. Money must be raised to fight the war and currency must be provided with which people might do their ordinary buying and selling.

It has been said that "necessity is the mother of

invention." It was probably because of the great need of the Civil War that the United States worked out its money system.

The first type developed was the "greenback," a kind of paper money that was the talk of the generation following the war. These greenbacks were not first-class money because they did not have gold or anything else of similar value back of


25 CTS.
TUCKER & STILES,
25
GOOD FOR TWENTY-FIVE CTS.
Payable in Current Bank Bills, in sums of
One Dollar and upwards.
BROOKLINE, N. H., July 15th, 1862.

"Shinplasters" Were Small Change in Paper Money. They Were Put Out by Business Houses and Finally by the Government During the Civil War

them. They were merely the government's promises to pay. It was again shown, as it had been shown many times before, that money based on a promise will not stand up. It must have actual values like gold back of it.

These greenbacks came to be worth less and less until they brought less than half their face value. When the war was over, however, they began to increase in value. The government kept promising to redeem them in gold and silver. Finally, fifteen

years after the war, it did begin paying gold and silver for them. Gold was put back of them. They became as good as gold. People decided that they did not mind keeping them. They did not care to have them redeemed.

So Congress passed a law which said that anybody who had one of these Civil War greenbacks might get gold for it whenever he wanted it. Every time one of them was redeemed, however, the Treasury Department should issue another in its place.

They thus became parts of an endless chain. They have been redeemed and reissued from that day to this. There were about three hundred forty-six million dollars worth of them out when the law was passed. Just that amount of them is still in circulation.

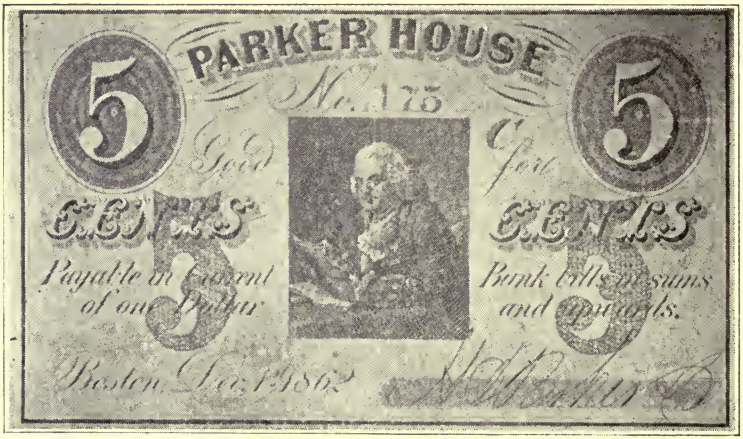
They are no longer called greenbacks. They are United States notes. The legend, "United States Note," is printed on their faces. They are one of the five kinds of money issued by the government. The ten-dollar bill with the buffalo on it was one of these Civil War greenbacks that has become the modern United States note.

These greenbacks were not a success when they were first used. The government therefore tried other money experiments during the Civil War. Chief among these were the national-bank notes.

The Treasury wanted to put out some paper money of which the dollars would keep on being worth a

dollar. After its bad luck with the greenbacks it knew that it had to put something back of this paper money. People had to know that these dollars could be changed into gold or something as good whenever they wanted it.

The Treasury worked out a scheme of chartering national banks and letting them issue paper money.



Even Hotels Put Out Their Own Fractional Currency During Civil War

They issued money and promised to redeem it just as the state banks had done before the war. In addition, however, the government made them deposit bonds at the Treasury. If they did not redeem their paper money the government would sell the bonds, get the money, and do so. The national-bank notes were absolutely sure of being redeemed.

These national-bank notes were the first absolutely good paper money issued by the government. They are still being issued. They have been in the pockets of the people for more than sixty years. That ten-dollar bill with Mr. McKinley's portrait on it was a national-bank note.

There is another quite important type of United States paper money that grew out of the Civil War. These notes are called gold certificates. They have yellow backs. There is no other paper money with

Cities Issued Such Paper Money as This During Civil War

a yellow back. The picture of Mr. Michael Hillegas, first treasurer of the United States, is on the front of them. A ten-dollar bill of this sort was among those found by the gentleman at the circus who was afraid of counterfeits.

It was during the Civil War that Congress passed a law that was the basis for this money. Under that law the owner of gold could deposit it and get yellow-backed paper money for it. This paper was, as a

matter of fact, a warehouse receipt. It meant that gold had been put in storage and that the owner of this receipt could go and get it whenever he wished.

The public, in those days, liked gold better than paper, and not much of this currency was issued for a long time. There was not a great deal of it up to the end of the last century.

At about that time, however, gold began to be very plentiful. The mines of the world were producing great quantities of it. It needed warehousing. So the people fell back on this Civil War measure for meeting a new problem. They have stored altogether about three thousand tons of this yellow metal in the Treasury and taken yellow-backed receipts for it.

This was first-class money from the standpoint of keeping its value. Since it could be changed into gold it was always worth as much as the gold for which it called. It was a perfect model of a secure paper money.

Hard money used to play a much more important part when people went out to buy than it does now. Silver made up the bulk of this hard money of the world for nearly two thousand years. Silver served its purpose well until the activities and wants of man grew so great that it looked as though he would soon need to take a wheelbarrow to carry his money when he went shopping.

So, back in 1878, the government decided that, instead of asking people to carry silver dollars in

their pockets it would issue warehouse receipts for silver and let them use those receipts as money. They could bring their silver dollars to the Treasury and get paper money for them.

In this way a new currency, silver certificates, came into being. The silver was put away and paper, for which the holder could get silver at any time, took its place. Enough silver dollars to load a freight train three and a half miles long are now stored in the Treasury. There are four hundred fifty millions of them. Ten of them were back of the bill with the picture of Hendricks on it that we encountered early in this chapter. Practically all the silver certificates, however, are more in the form of one-dollar bills. Notice that the words "Silver Certificate" are printed on one-dollar bills.

These three types of money that grew out of the Civil War and this last one, the silver certificate, were first-class money in many respects. They were secure. A dollar in paper of one of these types was worth just as much as a dollar in silver or gold. They were lighter and handier than the hard money. They were the paper money that the people used altogether for half a century. They are in part the paper money that it still uses.

But the government found that these paper moneys had one fault. It complained that they were not elastic. They would not stretch when stretching was necessary. When harvest time comes on, for

instance, the farmers need a great deal of money. When it is over they no longer need much of it. The government wanted to figure out a money that would flow forth when it was needed but come back to the Treasury when it was not in use. It tried to adjust the old kinds of money so they would do this but found that it could not. After much thought it decided to create a new money that did not have this fault.

This new money is called federal reserve currency.

The men at the circus found a ten-dollar bill of it. It was that one which carried the picture of President Andrew Jackson. It has become the most important part of the government's paper money. It will probably be the chief item in the money handled by all of us for the rest of our lives. The story of it will be told in the next chapter.

CHAPTER XIII

FEDERAL RESERVE NOTES

THE United States notes, the national-bank notes, the silver certificates, and the gold certificates did the bulk of the money work of the nation for fifty years after the Civil War.

They were good money in their way, were handy tools, quite useful in their time. But there is no standing still in this world. There must be advancement. The place of the tools of one generation is likely to be taken by something better in the next.

After 1900 these old notes were like grandma's sewing machine or an automobile of a model ten years back. They would not do certain things that the new age required of them.

When these old currencies were the only paper money there was always about the same amount of currency in the country all the time. Only so much could be issued. The amount depended on how much gold, silver, and United States bonds had been deposited at the Treasury.

One season times might be booming and there would be need for a great deal of money. The next year times might be dull and there would be need

for less. When harvest time came all the farmers would need money to pay the hired men, but between times they would not use so much.

But all the time there was the same amount of money.

What was needed was a system that would pour out plenty of money when it was needed but take it in and out of the way when it was not needed. The

An American Half Dollar of 1794

Treasury Department called this sort of system a flexible currency system. It wanted a flexible system.

For ten years, early in this century, the wise men in money matters worked to find an elastic money. In the end they developed federal reserve notes. They were put out by the federal reserve system.

Under this system the country was given, for the first time, all the money it needed to carry on its

business. It had plenty when times were good. It had just enough when they were only fair. It did not have too much when times were bad.

Marco Polo had brought the idea of paper money back from China six hundred years earlier. The nations of the world had been trying all that time to work out the proper scheme for using it. Here, finally, the riddle had been solved. A scheme for furnishing the public always the right amount of money had been worked out.

Under the old scheme certain amounts of money were printed by the government and put out and that was the end of it. This money might do the work and it might not. If it did not there might be much trouble, a financial crash.

Under the federal reserve system the government printed this new sort of paper money. It kept the old paper money and added this new kind to it. There were vast quantities of it. Twelve federal reserve banks were set up, each in a different part of the country. Each was to take care of the smaller banks in its section. It was to give out the money through them.

The farmers of Kansas, for example, would know that they would need money for harvesting in June. They would go to the little banks and arrange to borrow it. A thousand of them might come to the same bank. Each would give the banker a note which he promised to pay in sixty days.

The country banker would bundle up these notes and send them to the federal reserve bank nearest him, that at Kansas City. The federal reserve bank, on this security, would send him paper money. He would hand it out to the farmers. There would be no scarcity during harvest.

When harvest was over, however, there would no longer be use for so much money. The farmers would come in to pay their notes. The merchants

THIS WAS GOOD FOR HALF A "BIT" OR $\frac{1}{16}$ OF A DOLLAR

would deposit the money they had taken in. Nobody keeps idle money around. People pay debts with it or deposit it in the bank.

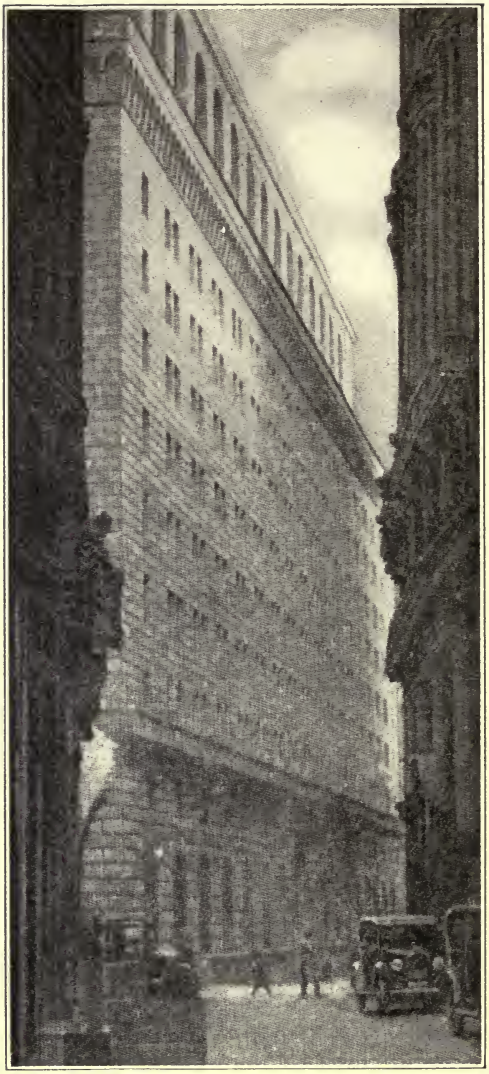
All this extra money would pile up in the country bank. That bank would send it back to the big bank in Kansas City. It would do this because it was paying interest to that bank on what it had drawn out. It would save money by doing so. All the money that was not needed would go back to the point from which it had started.

In this way the money that is needed for Christmas buying flows forth, is used, and flows back. So does the money for paying taxes. So does the money for summer vacations. The smaller banks can get it when they want it. They keep it, however, only as long as it is working, then send it back. They would lose if they kept idle money around.

The work of the federal reserve banks is not as simple as this, of course, but giving out this paper money of the government to be used by the people is, as a matter of fact, one of the most important things they do.

It is an odd sort of bank, this federal reserve. It is a banker's bank. Banks use it just as individuals use the ordinary bank. They keep their extra money there. They borrow from it when they need money. They deposit their checks there for collection. They go there for the cash on which to run. Banks use this master bank just as a business man goes to the bank in his town for one service or another.

The greatest of all these bankers' banks is the federal reserve bank of New York City. It is interesting to go there and see it work. In the early morning, its customers come in for a little cash. They want to draw out the money they are likely to need during the day. They do not fit their notes into a wallet and tuck them into their pockets, however, as the customers of your bank and mine.



THE GREAT FEDERAL RESERVE BANK IN NEW YORK

The customers of this federal reserve bank are the great banks of New York City. They send an automobile covered with armor for their money. Four guards with guns strapped at their sides go with it. They take great leather bags, like stout traveling bags, with them.

An official of the bank drawing the money is there with a slip of paper which calls for $50,000 in one-dollar bills. That number of one-dollar bills will fill two bags. They will weigh 150 pounds.

This bank would also like $200,000 in five-dollar notes. It would take 120 pounds of paper, of these five-dollar notes, to make $200,000. Maybe they would go in one big bag.

Then there would be an entry on the slip calling for $200,000 in tens and the same in twenties. There would be but 90 pounds in this bag containing $400,000 in notes of the higher denominations. Then this bank would like the balance of a million dollars, $350,000, in thousand-dollar bills. This is the richest package of them all but it does not bulk so large. There would be but three hundred fifty bills in this package. One might slip it into his outside coat pocket. It weighs only about a pound. It can be thrown into the corner of the bag that already has $400,000.

These bags containing a million dollars are put on a little rubber-tired wagon, soft-going for these bank corridors, and wheeled away, between files of armed

guards, to the steel-bodied truck that waits in the barred courtyard.

Then in the afternoon at this bankers' bank, money is coming in instead of going out. The big banks are bringing in the money they have taken in and

CAGES IN THE NEW YORK FEDERAL RESERVE BANK WHICH DAILY HANDLE MORE MONEY THAN ANY OTHER AGENCY ON EARTH

for which they have no use in their vaults. One such bank may have a ton of nickels. The subway company has collected them for rides and turned them in. It may have a trunk full of worn money brought to New York by people who have come from far-away places. New York gets a great deal of used money

because people come to New York from everywhere and bring money to spend. A depositor may bring in a shipment of gold sovereigns from England, or Italian paper money brought over by newly arrived immigrants.

The depositor comes to this odd bank with his wagon load of money. He, also, brings it in an armored truck with armed guards. It is carted up to a receiving teller's window. But the depositor does not stand there outside the window, first on one foot and then on the other. He goes inside a cage which has a high stool and shelves on which he can lay out his money, stacked up like wood for the kitchen stove. He is locked into that cage. It takes him two hours to make this deposit, which may amount to ten million dollars. The bank will give him credit for his nickels, his worn money, his foreign money, and start each back in the money channels to which it belongs. The next morning it will issue him new money in its place.

Or the money may come in by registered mail. I saw a shipment of five hundred thousand dollars of it that had come in from a bank in Coney Island. For the most part, it consisted of dollar bills that had been spent there during a single week end.

These federal reserve banks are the most marvelous banks in all the world. They perform many services besides putting out the new money and redeeming the old. They help the government all

the time in its money affairs. They are its money advisers. It works through them in such matters as selling government bonds, in keeping panics away, in aiding industrial development. These banks are owned by the member banks but they act as fiscal agents of the government. Their notes are now a very popular sort of paper money. The time may come when they will be the only paper money. This currency is the new tool that may do away with the old ones. Its use for all purposes would make the money system much simpler.

CHAPTER XIV

QUANTITY OF PAPER

PEOPLE are used to handling paper money in small quantities, two or three or half a dozen bills at a time. Yet there are tons, car loads, train loads, of this paper money in the country. There are storerooms where it is stacked up like merchandise at the freight yards. There are trucks that do nothing but haul it about in bulk as wheat is carted from one place to another.

All this money comes from the same place, the Treasury Department at Washington. There must be a huge stream of it from the Treasury all the time, for it must spread to every corner of the nation. It is like an irrigation canal of the West. It starts out as a strong current. Then it is divided into smaller streams which carry the water to different parts of the plain to be irrigated. These are divided into yet smaller streams that lead to individual farms. Finally there is the small trickle that carries life-giving moisture to the individual orange tree that it may bloom and bear fruit.

So does the money flow out from Washington until it reaches the last individual citizen. Out there in

the farthest community it is passed from hand to hand, does its work as money, is worn out. It must come back to Washington that it may be redeemed, that brand-new bills may be issued in its stead. The tiny currents of money begin to trickle back from the farthest points, as the little streams from far up on the Continental Divide begin to flow down the slopes to join other and yet others of their kind that grow to be rivers.

The money streams flow through the banks. The little far-away bank sends its worn-out money to the bigger bank in a near-by town. There it is joined by money from other little banks. This used money flows on to a yet bigger center where it goes in with similar frayed-out hoards, all on a pilgrimage back to Washington where it may be born again. Finally there is a torrent of worn money pouring itself into the Treasury. It is there, as the money goes out or comes in, that the bulk of it can be measured.

Always, in the United States, there are close to a billion pieces of paper money in circulation. Each piece lasts about a year. The dollar bills do not last so long but the bigger bills last longer. The average is about a year. So a billion new bills must flow from the Treasury each year and a billion worn ones must flow back.

It is hard to think of a number so large as a billion. Suppose we think of these bills all pinned together into a carpet. In that form they would cover six

square miles. They would blanket twelve hundred ordinary city blocks. They would carpet a road thirty feet wide and a thousand miles long. They would make a strip ten feet wide from New York to San Francisco.

One rarely thinks of these precious slips of paper even in terms of pounds. That is why it seems so strange to learn that, down in Washington, they are worked with every day much as hay is handled out on the farm. Tons of paper money are always in the process of being made ready, as is hay in the country during the harvest season.

A very large farm it would take to yield as much hay in a year as the government produces in paper money. The crop, in fact, amounts to nearly fifteen hundred tons. It would be a good thousand-acre farm that would do as well in hay.

Four or five tons of paper money are finished in Washington every working day. This money is promptly put up in packages and shipped about the country to banks. These banks pay it out to their customers, who come to the paying teller's window with their checks. Thus it is distributed. Thus it is broken up into single bills or little groups of them, such as people we know carry in their wallets.

The money in a full wallet, one containing twenty bills, would weigh less than an ounce. One would need carry a roll of three hundred thirty-four bills to have a pound of paper money. A hundred pounds

FOUR OR FIVE TONS OF PAPER MONEY GO OUT FROM THE TREASURY DEPARTMENT EVERY DAY

of it in a sack would contain thirty-three thousand to thirty-four thousand bills. If they were one-dollar bills they would not be a very big fortune. If they were thousand-dollar bills, however, they would amount to thirty or forty million dollars.

Half of these bills that flow out of and into the Treasury are one-dollar bills. There are seven hundred to eight hundred tons of them shipped out every year and the same number, less those that are lost, come straggling back again all tattered and torn from much usage.

A thousand dollars in these one-dollar bills would weigh three pounds. A hundred thousand of them, which would be a snug fortune as fortunes go, would weigh three hundred pounds. It would take a ton and a half of them to make one a millionaire. If this quantity of dollar bills grew in a hay field, it would take a good team of horses and a strong wagon to bring them to town. The seven hundred tons of them that are made each year would load a string of farm wagons seven miles long. They would furnish average loads for a string of twenty freight cars and so would make up a fairly good train load of paper money.

But there are other notes much like these one-dollar bills, but with different figures printed on them, that are much more valuable. The most precious of all the bills printed by the government are its ten-thousand-dollar notes. There are about

sixty thousand of these in existence and they rarely get outside the banks, although any one who wants one can get it in exchange for whatever kind of money he has. These sixty thousand bills weigh about one hundred eighty pounds. Done up in a

PAPER MONEY READY TO SHIP OUT TO THE BANKS

package they would be the most precious one hundred eighty pounds that ever existed in this world. They would be worth six hundred million dollars. They would be worth more than those seven hundred tons of dollar bills, the twenty carloads of them, that the government turns out each year. Yet a strong man

could walk off with this master package slung across his shoulder.

The Treasury Department puts its money up in packages about as big as a dime's worth of ice. It can get four thousand bills in such a package. Such a package weighs twelve pounds. It is in these packages, largely, that the government ships its paper money about the country. If such a package contains one-dollar bills it is, of course, worth four thousand dollars. But if each bill is worth ten thousand dollars, such a package would have a value of four million dollars.

In the Treasury at Washington there is such a package. It rests in an inner vault protected by many great doors guarded by ingenious time locks. I have been allowed to go into that inner vault and hold in my hands this package containing four million dollars, probably the most precious twelve pounds wrapped up anywhere in the world.

As compared with the seven hundred tons of one-dollar bills, and the one hundred eighty pounds of ten-thousand-dollar bills, the two-dollar bills make up a package that is not very important. There are only some fifty tons of two-dollar bills in the United States.

There are five times as many five-dollar bills. It would take one hundred twenty-two-ton trucks to haul the five-dollar bills if they were all put together.

The ten-dollar bills bulk a little less. Precious

as they are, however, some two hundred tons of them are scattered among the people. It would take five freight cars to haul them if they went on the same journey, traveling at the same time.

The twenty-dollar bill is so large a piece of money that one does not often see it. Yet there are so many of them in circulation that it would take twenty-two hundred men, each with a pack on his back weighing a hundred pounds, to carry them.

There are five tons of hundred-dollar bills. They would make a load for a four-horse wagon.

A thousand-dollar note is a very precious thing. It is a rare man who has ever possessed one. Probably not one person in five has ever seen one. Yet there are one hundred seventy thousand in circulation in the United States. Since a thousand notes weigh three pounds, these thousand-dollar notes, taken all together, would weigh more than five hundred pounds. Done up in twelve-pound packages there would be forty of them. They would fit neatly into the tonneau of a touring car and weight it down just about as would three passengers.

The bulk of the paper money that the government makes and sends out for the convenience of its people increased greatly between 1915 and 1925. The public, in fact, during that period came to use about twice as much paper money as it did before. This was thought to be due to the increase in wages which the people earned and the increase in the prices

which they paid for whatever they bought. The fact that the habit of going to motion-picture shows increased so greatly had something to do with it. The people must carry money in their pockets with which to go to the movies. Then there was the increased use of the automobile. Many more people rode in automobiles. All of them had to carry enough money to buy oil and gasoline and to pay for fixing the car if it broke down. The quantity of money needed to be increased, as the people came to use it for more and more purposes.

CHAPTER XV

THE PROPER USE OF MONEY

A STUDY of currency in use in the United States, made by experts for the Treasury Department, indicates that the public has fallen into certain money habits that are bad, that occasion inconvenience to the business community, that cause banks and other handlers of money much unnecessary work, and that directly cost the government millions of dollars a year.

The first of these bad-money habits is the too great use of the one-dollar bill. The country in 1925 used seven times as many one-dollar bills as it did in 1900, and three times as many as it did in 1910. There are reasons for an increased use of this element in the currency, among the chief of which are increased prices and the development of the automobile and the motion-picture show. They call for more small denomination money. It is not believed, however, that they made necessary seven times as much of it as was used twenty-five years earlier.

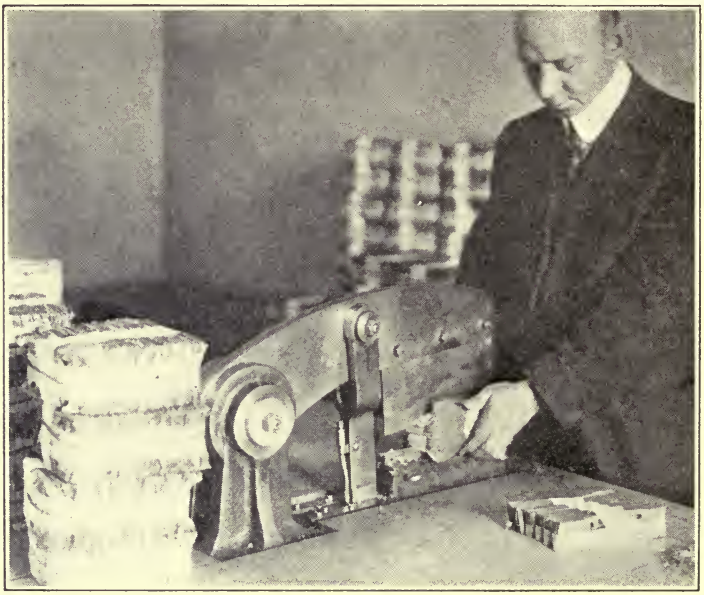
The public, it is believed, tends more strongly than it should to the use of one-dollar bills to the exclusion of other denominations. Instead of carrying a five-

dollar bill, or a ten-dollar bill, many individuals have the habit of carrying five ones, or ten ones, as the case may be. It is no uncommon thing to see a man pull twelve or fifteen one-dollar bills out of his pocket. This man uses that number of bills where two of higher denomination might serve his purpose just as well.

Wherever an individual uses more bills than he should he starts a long train of useless work. He may, for example, cash a ten-dollar check at the bank and ask for one-dollar bills. The teller must count out ten bills where one ten would do The recipient makes a ten-dollar purchase. He must take the time to count his ten ones. The merchant from whom he buys must also count those ten ones. He must have space in his till in which to store them away, together with the one-dollar bills of all such customers. At the end of the day he must count his cash. It takes longer to count a thousand dollars that is largely ones than it would to count the same thousand made up chiefly of fives, tens, or twenties. The larger the bills the sooner they are counted. The merchant takes his money to his bank for deposit. There the cashier must consume considerable time in counting many ones. The bank must have space to store them, and thousands in these ones bulk large.

As the money becomes worn it must be sorted; the bad bills must be taken out and sent to the Treasury

for redemption, where it must be counted and recounted, and sorted as to type. It must be carefully examined to see that none of it is counterfeit. It must have holes punched in it. It must be cut



THIS TREASURY DEPARTMENT MACHINE CUTS UP THE SOILED MONEY WHEN IT COMES BACK FOR REDEMPTION

in two, recounted, and in the presence of certain officials, it must be ground into pulp and thus cease to be money.

At every stage of this procedure it costs ten times as much to handle a thousand dollars in one-dollar bills as it does to handle a thousand dollars in tens.

It costs five times as much as it does to handle a thousand dollars in fives, twice as much as it does to handle a thousand dollars in twos. So it is cheaper for the government if the people use the larger bills.

In the matter of its use of two-dollar bills the public has formed another bad habit. It has grown to consider a two-dollar bill as bringing bad luck. The superstition still prevails. People do not like to use two-dollar bills.

One theory of the origin of this belief that a two-dollar bill brings bad luck goes back to the old buccaneering days of the Spanish Main. Pieces-of-eight were the granddaddies of the good American dollar. Pieces-of-eight were Spanish silver coins. There were pieces-of-six, pieces-of-ten, of twelve, and, finally, of thirteen. Pieces-of-thirteen were huge, Spanish, silver coins, worth about as much as the English ten-shilling piece. They were, roughly, two dollars. They were regarded with superstition by the buccaneers because they were pieces-of-thirteen, and thirteen to them was an unlucky number. The two-dollar bill is the modern piece-of-thirteen. The superstition of ill omen still follows it.

Of course a modern world would not, if it ever stopped to think, allow an ancient superstition of this sort to stand in its way in the conduct of its practical everyday affairs. It playfully says that the two-dollar bill is bad luck. It tears a corner off of it to break the jinx. It is surprising to observe

the number of missing corners of two-dollar bills coming in for redemption. If the public realized that it was depriving itself of a convenient bit of currency, which otherwise would serve a useful purpose, it would discard the practice of scorning two-dollar bills.

In Canada the two-dollar bill is in use and the superstition against it does not prevail. In proportion to one-dollar bills in circulation Canada uses nearly five times as many twos as does the United States. In England the smallest bill is worth ten shillings, which is a little more than two dollars. The two-dollar bill is, in fact, a useful piece of currency which should be restored to much more general use.

Providing paper money for all the people, passing it through channels until it reaches the pockets of each of them wherever he may be, allowing it to serve its purpose, getting it back when it is worn, redeeming and replacing it, is a stupendous task. It is a task, part of the burden of which falls on the government and part on the business community. It is a task that deserves study. If it can be lessened the public will be benefited.

It takes about fifteen hundred tons of paper money a year to keep the business of the nation going. More than half of the huge quantity of money is in dollar bills. If the public could be brought to give thought to its use of paper money, to use more bills

of larger denomination and fewer one-dollar bills, to use more twos, fives, and tens, it might save a quarter of the bulk of the dollar bills used. It seems probable that the public interest would be served if the bulk of dollar bills in use was reduced by one-fourth, by

DESTROYING WORN MONEY

some one hundred fifty or two hundred tons a year. This would save the government from one to two million dollars at its money print shop. What it would save the business community by easing the task of money handling is beyond knowing.

There is a simple principle backed by common sense in the handling of money. This principle is

to keep money, to receive it, or to pay it out, always in the least possible number of bills.

This principle should be borne in mind merely for general guidance. There may often be reasons for paying out money on a different basis. When there is need of a larger amount of smaller denomination notes, they should be used. When there is no reason for payment being made otherwise, it should be made in the smallest possible number of bills. By following this rule the bulk of paper money in circulation could be greatly reduced.

CHAPTER XVI

PAPER FOR THE NOTES

BEYOND a doubt one of the greatest honors that ever comes to a piece of paper is to have itself run through certain printing presses and thereupon to become a ten-thousand-dollar bill.

One moment it is a blank sheet of paper worth less than a cent and of little interest to anybody in the world. The next, its face and back having been stamped with ink, it is a thing for which men toil, suffer, fight, die. Yesterday it was no more than a sheet on which one writes a letter. To-day it is worth the savings of a lifetime.

The government, in applying the magic that makes slips of paper more precious than gold, takes a great deal of thought of the thing it makes. In the first place it must fashion its money in such a way that nobody else can put ink on pieces of paper, cause them to look like government notes, and use them instead of lawful money. In the second place it must so make them that they will last a long time. When it sends them out to its farthest border it does not want them to wear out quickly.

In making them hard to counterfeit and hard to

wear out, the quality of the paper is a very important item. The government takes a great deal of thought as to the sort of paper it uses for its money.

Paper making is a very odd and interesting thing. Paper was first made by the wasps. Wasps' nests

THIS MACHINE TESTS THE AMOUNT OF RUBBING IT WILL TAKE TO WEAR THROUGH A PIECE OF PAPER. WHEN A HOLE IS RUBBED AN ELECTRIC CONTACT IS MADE WHICH STOPS THE MACHINE. BUT THE MACHINE HAS COUNTED THE NUMBER OF RUBS IT MADE

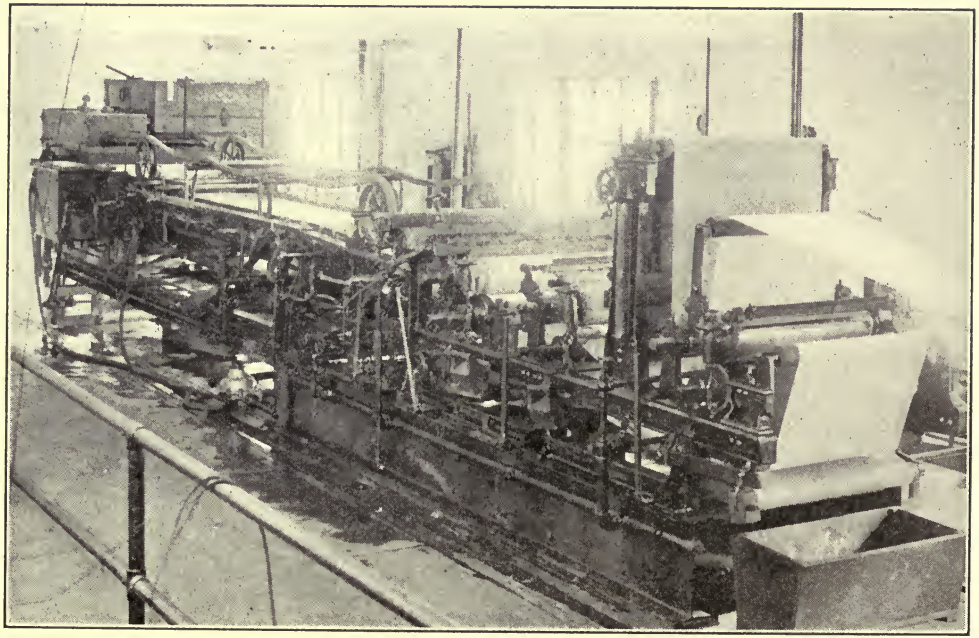
are made of paper. The wasps find a piece of split or broken timber where the fibers show. They take these fibers, moisten them, work them into a pulp, and mold their nests of them. Nearly all paper is

made of plant fiber and in just this way. The paper mill uses a development of the method of the wasp.

It is not known that the Chinese learned the trick from the wasps, but certain it is that they began making paper from wood fiber some eighteen hundred years ago. They chose the soft fiber that formed the inner bark of their mulberry trees. They beat this fiber up into a fine pulp. In this way it became a mass of tiny fibers, each free from the other. The Chinese would pour a great deal of water in with these fibers and stir the mixture. They would keep putting in water until the mixture looked like thin buttermilk.

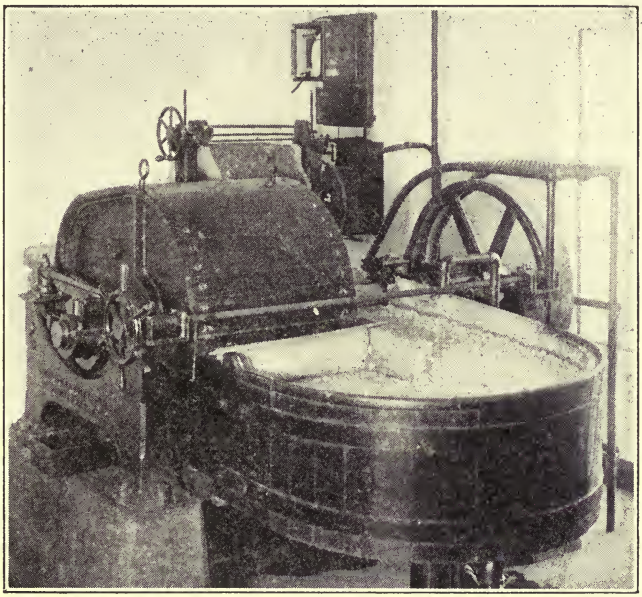
Then they would take a vessel which looked like a shallow bread pan with a fine strainer for a bottom. They would dip this into the fiber water and, as the liquid ran out, would shake the mixture so that the fibers would settle evenly. When the water was all gone, the layer of fiber would be left. The fibers would be crisscrossed in every direction so, when dried, the sheet would hold together. This set sheet would be spread out between pieces of cloth, pressed, and allowed to dry. It would become paper. In England to this day certain very fine paper is made in just this way.

Practically all the paper in the world is still made on this principle, out of this one thing, plant fiber. The big mills may eat up the trunks of the trees of whole forests. Beating engines may take the place



THE GOVERNMENT'S PAPER-MAKING MACHINE AT THE BUREAU OF STANDARDS

of the old-time pounding of the pulp by hand. This pulp may pass through huge vats of chemicals for bleaching. Immense machines as big as threshing machines may take hold of this pulp and convert it into paper. One mill may produce hundreds of tons



THE BEATER WHICH CHOPS OFF THE FIBER INTO JUST THE RIGHT LENGTHS

of finished paper every day. But the principle is the same. The plant fiber is strained out of the pulp buttermilk and sheets of paper are the result.

The modern paper manufacturer, however, does not dip his strainers into this mixture. Instead, the

pulp runs out in a steady stream on to sieves that move along like great belts. As they go they are shaken, and the fiber settles evenly on them. Gradually the water all leaks out. By the time they have gone thirty feet these belts of fiber have become strips of what begins to look like sheets of thin blotting paper.

These strips are passed through rollers which squeeze out the water and then run on to other rollers which are heated and are called drying drums. They are now rough paper. They then go into another series of rollers where a great deal of pressure is put upon them. This process is called calendering. It makes the paper smooth and glossy. The strips may also be run through a bath of glue, called sizing, which makes them stronger and glossier. Finally they are rolled up on great spools or cut into sheets.

These great paper-making machines are controlled by the mere pressure of a button. They produce huge amounts of paper. The principle on which they are based, however, is the same as that by which the Chinese made paper nearly two thousand years ago.

The fibers of the plants form the basis of practically all paper. The quality of the paper, of course, depends a great deal on the kind of fiber that is used just as the quality of a dress might depend on whether silk or cotton goods were used. One of the best plant fibers in the world is that of which linen cloth

is made. It seems natural, therefore, that linen paper should be excellent. Another plant fiber that rates high but is not quite so good as linen, is cotton. It would be expected that cotton should furnish the

Under the Microscope the Fibers in Rag Paper Look Like This

second best material for paper. Poorer papers are made of the fibers of straw, various grasses, and wood pulp. Newspapers are printed on paper made of wood pulp.

Early paper makers depended largely on linen and

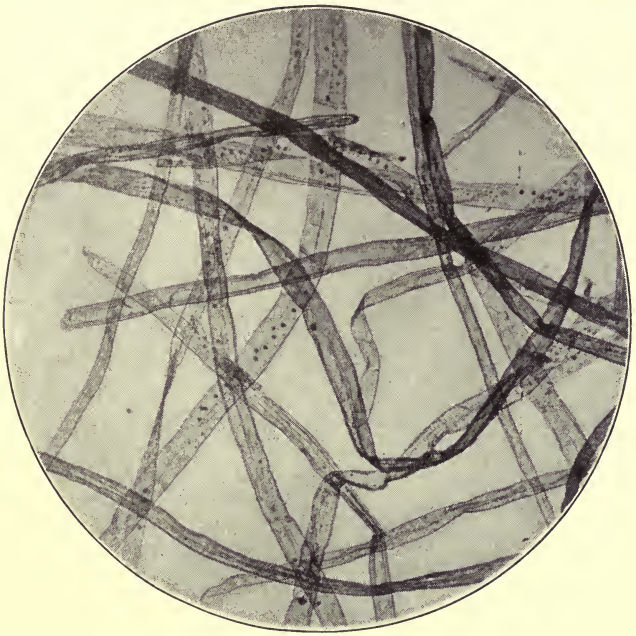
cotton as a basis of their product. Naturally they wanted to get their materials as cheaply as possible and so, instead of using new linen and cotton, they bought rags of these materials. The rags made as good paper as new material. It is to supply the paper makers that ragmen go about all the streets and alleys of all the cities of the world.

When the government came to get the paper for its money it turned naturally to linen. It found, however, that linen had some qualities that did not exactly suit for money manufacture. It was a bit harsh. It would print better if it were a little softer. For this reason it was decided that a little cotton rag should be mixed with it. Finally the experts, after many experiments, decided that the best paper for money printing should be about seventy-five per cent linen and twenty-five per cent cotton. For nearly half a century now the money paper has usually been made of those two materials in something like these proportions.

The government calls its money paper "distinctive" paper. It wants it to be different from all other paper. It wants it to be impossible for counterfeiters to get paper like it. Then it will be hard for them to produce bills that look like those of the government.

So the government makes the paper which it uses for its money in secret. Nobody on the outside can make a paper that looks just like it. There is a

peculiar mark that the government works into its money paper. It puts certain silk fibers through it. Examine any piece of paper money and you will see certain little red and blue lines straggling through it.



EXPERTS, SEEING THIS SORT OF FIBER THROUGH THEIR MICROSCOPES, KNOW THAT IT IS WOOD FIBER

These are the silk fibers that make it different from other paper.

The government has bought its money paper from the same maker for a long time. It must have so much of this paper that there is always one big mill

and sometimes two that are working on nothing else. It must have something like three hundred million sheets a year. Each of these sheets is big enough to make eight bills. So three hundred million sheets would make something more than two billion bills. This is a very great deal of paper. There are more than three and a half million pounds of it. There are some eighteen thousand tons of it. It would load four hundred fifty freight cars. There would be a train of them four miles long. Making the paper for the government's money is a big job.

The government had used this paper, supplied to it by contract with certain mills, for nearly fifty years when, after the war, its Bureau of Efficiency began to wonder if the product were all that it should be. The paper dollars lasted only seven months. Could they not be made to last longer?

The government began to inquire into the making of this money paper. It actually produced other paper very much like it at the Bureau of Standards. It questioned every step in the paper making. Since plant fiber was the basis of paper, it argued, scientists should study the fibers and what happened to them in the course of manufacture. When the lye was put in for the bleaching, was it so severe that it weakened the fiber? If the fiber was bleached a little less would it not be stronger? Would this not make the paper last longer? They tried fiber that had been bleached less.

Was seventy-five per cent linen and twenty-five per cent cotton the right mixture? Might it not be a good idea to try other combinations to see if they would not be a better money paper? In the progress

RAGS BEING WORKED INTO PROPER SHAPE FOR PAPER MAKING

of paper making certain new fibers were being used that were not known back in the days when folks thought that there was nothing like linen and rag. There is Manila hemp, for instance, which makes a

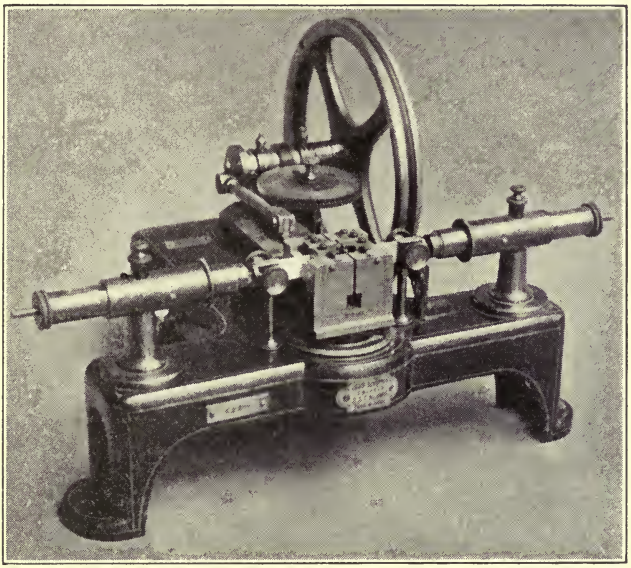
very strong paper. It is hard to bleach white but it has strength. Perhaps it would be a good idea to put some Manila hemp into the money paper despite the fact that it is yellowish. China makes paper out of another grass called *ramie,* while in South America there is yet another known as *caroa.* All of these were studied.

The paper building blocks, the individual fragments of fiber should be examined. The qualities of the paper depend largely on them. Science would study them.

When the linen and cotton rags went into the beater to be pounded into pulp were they not beaten too long? Did not too much beating make the fibers too short and the paper weaker? Where should the beating stop?

It was obvious that the beater, the machine that chopped up the fiber, had more to do with the nature of these microscopic building blocks than anything else. The more the fiber was beaten the shorter the individual pieces of it became. The shorter the pieces became the weaker the paper, for the strength of paper depends on an intertwining of these fibers which bind it together. Yet the fiber had to be well beaten to become smooth. The problem was to beat it until it was short enough to get the requisite smoothness but to stop as soon as that end was attained. All the extra beating weakened the paper.

At the factory the fiber was beaten something like twenty-four hours. These government scientists beat fiber that length of time and made paper of it at their own paper mill at Washington. It was just



A Slip of Paper Put into This Machine Is Folded and Unfolded Until It Breaks and the Machine Stops. Thus the Number of Foldings Are Counted

like the paper then being used for printing money. It had the same strength, withstood similar tests.

Then these scientists used the same materials but beat them eighteen hours instead of twenty-four hours. The paper seemed still smooth enough for money purposes. Would it be any stronger?

The Bureau of Standards has many interesting methods of testing paper. There is the folding test, for instance. The number of times that a piece of paper will fold before it breaks is one of the best tests of its endurance. The Bureau has a machine called the folding endurance tester. A slip of paper is adjusted to it and the current turned on. It is folded back and forth, back and forth. Every time it is folded the machine counts the fold. When the paper is broken the machine stops. It shows the number of the fold on which the break came.

In these money paper experiments results were immediate. The paper doctors had found the trouble with the patient at the first try. The fiber was being beaten too much and thereby weakened. If it were beaten less it would be stronger. Other experiments were tried in beating the paper different lengths of time. The folding strength of the paper went up from two thousand to thirty-five hundred, to four thousand, and some of it even to six thousand.

Working in this way the government was able to get better paper on which to print its money. So, in 1926, it began to put out money that lasted longer than any it had ever made before.

CHAPTER XVII

ENGRAVING THE PLATES

THE great money factory of the government is known as the Bureau of Engraving and Printing. It is situated in Washington. It is the biggest money factory in all the world. It makes every bill of United States paper money that every citizen uses through all his life. It is the greatest of money factories because the United States is the richest of nations, and its people must have more money for their buying and selling than any other people. About four thousand people work in this money factory. With great care they finish four or five tons of money every day. The government spends something like ten million dollars a year in keeping this factory in operation.

The very name of this Bureau shows that it has two tasks, one of engraving and the other of printing. The printing is the bigger of the two jobs. Nine-tenths of the employees work at it.

The engraving of the plates, however, is at the very bottom of the whole scheme of using paper for money. It is the most exact and delicate task in all the world. Unless it is so well done that no living

BUREAU OF ENGRAVING AND PRINTING IN WASHINGTON

person can copy the job, the paper money of the nation becomes useless. If the counterfeiter can make other money just like it, he can take that money to the Treasury and exchange it for gold. This would wreck the government.

The fact that the paper for the money is made by a secret process, that it is hard to get other paper like it, is the first step toward making it hard to counterfeit the output of this government factory. The second step which is the most important part in the whole scheme is the engraving of the plates.

Most printing is made from raised surfaces, as, for example, from type. The pictures in newspapers are printed from raised surfaces also. This process is called relief printing.

An entirely different method is used in printing the money. It is printed from engraved plates. Instead of raised surfaces where the letters or pictures are to appear, there are sunken lines, depressions. The engraver has here carved away the steel. He has made little valleys in the plate and these, when it comes to printing, pass under an inking roller and are filled with ink. When the paper is forced down on these plates it takes up the ink. This printing, from sunken lines beneath the surface instead of from raised lines above it, is called intaglio printing. The government's money is turned out by intaglio printing. It is the most delicate and difficult sort of printing done anywhere.

The plates for this intaglio printing must be engraved. They are steel plates so the task is not easy. Steel engraving is such an unusual thing now when men make plates by photographic processes that there are not many steel engravers in the world. Printing is so easy these days that not many people go out of their way to make it hard. In this case there are special reasons for making it hard. It is probably true that half of the steel engravers in the world work here in the government money shop.

The government, not so long ago, decided that it would get out a new kind of one-dollar bill. The result was the silver-certificate, one-dollar bill, which is almost the only sort of one-dollar bill seen nowadays. If you will look at the face of such a one-dollar bill, you will see that the central figure is the portrait of Washington. It is a very excellent portrait at that. Notice how it stands out from the paper. That is an effect that only the great artist can get. It depends on the depths that are given the little sunken lines of the plate. Notice also the fine cross hatching of the background. That is very important from the standpoint of being hard to counterfeit. Great detail is also shown in the texture of the coat.

In the engraving division of the government's money factory its best engraver of portraits sat for months with a magnifying glass at his eye and a deli-

cate carving instrument, that would cut steel, in his hand. He cut out the lines in the steel with this graver. He made the little depressions that would hold the ink that would print this particular picture of Washington.

Then this plate went to another engraver. This man was a specialist in making the detail of the borders that run around the bill. Notice how fine the lines are and how many of them there are. When this man's work was done the plate went to another engraver who also had a specialty. He was a letterer. He could cut letters in steel as could few men in all the world.

When this plate was finished it had the work of three men on it, each a specialist. There are not many men outside the Bureau who are expert enough to even copy this engraving. If one should try it he must, in the first place, make this face of Washington which is a masterpiece. He must be a high-class artist on portraits. Then he must copy the borders. He must be a good border man. Then he must be a letterer of great skill.

In each of these tasks one man's work is different from another's just as handwritings are different. In this way the task of engraving one of these plates becomes so difficult that no man can do it so well that his counterfeit bills will not be recognized very quickly.

After months of careful work in the engraving

department this little plate, a little more than three inches wide and seven inches long, is finally finished. The engraving has been done on soft steel. This soft steel is now made very hard by the scientific

ENGRAVING INSPECTORS

treatment that is given it. It is heated to just the right temperature in cyanide of potassium and then plunged quickly into oil or brine. So the Bureau finishes a single plate of very great hardness.

But to print two or three tons of dollar bills a day the Bureau of Engraving and Printing must have

many plates just alike. It must find a way to reproduce this one plate that it has so carefully made.

The Bureau does this very cleverly. It has this one flat plate on hardened steel. It then makes a cylinder of soft steel that is about four inches through. It puts its plate on the bed of what it calls a transfer press. It rolls this cylinder of soft steel over the hard steel plate. It puts on many tons of pressure. The result is that the roll of soft steel is pressed into every groove of the hard plate. It comes away with the engraving on it. But instead of depressions as in the plate the engraving stands out on the roll. It is in relief. There are hills where, in the plate, there were valleys.

This steel roll is now put through the hardening process. It becomes a master roll. From it as many plates as are wanted can be made.

Sheets of soft steel big enough to take eight impressions from this master roll are laid down on the transfer press. Great pressure is applied and the imprint is transferred eight times to this sheet of soft steel. The final plate, then, has upon it eight exact reproductions of the original that the engraver cut with his diamond-tipped tool. This big plate is hardened. It becomes one of the plates that go on the presses and from which the actual money is printed. As many as are needed may be made from this master roll.

One usually thinks of vaults in which money or

jewelry is stored as being the holders of the most precious things on earth. The government's storehouses of gold, the vaults in which it keeps its reserves of paper money, hold great wealth. Here in the Bureau of Engraving and Printing, however, it has a vault in which it keeps the master rolls and the plates from which the money is printed. If people who know how to use them could get hold of these plates, they could print money just like that of the government. One plate with the thousand-dollar bill on it could be used to produce millions almost at will.

So it is necessary that the government take great care in the protection of its plate vault. It is built underground. It has huge time locks on its one door that can be opened only at certain times and by authorized individuals. It is surrounded with such wiring that the slightest attack of its walls will set off resounding alarms. It stands like a huge box suspended in air. There are passageways all around it, over it, and under it. A watchman can stand at one point and, through an arrangement of reflecting mirrors, can see all around it, over it, under it. It is an amusing thing to stand at a certain point and allow a guard to walk all around the vault and see him at every stage of his journey.

No plate may leave this vault without being checked out by a proper authority. It goes under guard to a certain machine where record is made of

every impression taken from it. Each act of it during its absence is known, recorded. When its work is done it is checked back into its vault and the time lock set. There it stays with the ten-dollar plate, the hundred-dollar plate, the thousand-dollar plate, even with that aristocrat of them all, the ten-thousand-dollar plate. All come back to this, their darksome home. Here they may be disturbed by no intruder from the busy world outside. Here may come only one or two attendants clothed with that rare authority which admits them. For all others it would be easier to visit the North Pole than this, the home of the plates of steel that are the parents of all the paper money that is used by citizens of the richest of nations. For this is the starting place of the dollar, the dominant currency of the world, the best thing in this handy tool, money, that has been devised since time began.

CHAPTER XVIII

PRINTING THE MONEY

THERE are many unusual features surrounding the printing of the government's paper money. In the first place this printing of complicated designs from engraved plates is done in almost no place outside this government shop. Up to the time of the World War it was done almost entirely on hand presses. Now a peculiar flat-bed power press is used that was developed for this very purpose.

In printing dollar bills on one of these presses, four of those flat plates that are kept so carefully locked up in the Bureau's vault are drawn out. It should be remembered that eight imprints of the original engraving have been transferred to each of these plates. Each plate will print eight bills at a time. There is a place on each of the presses for four of these plates. The backs are printed first.

The power is turned on. The flat-beds carrying these four plates begin moving round in a circle. First they pass under a roller which covers the whole surface of the plates with ink. Then they go on to another roller which wipes the ink off the surface but does not, of course, reach down into the sunken lines

that are below the surface. Three-fourths of the ink used by the Bureau is thus wiped off and lost. But ink remains in those sunken lines. The plate is polished by the printer with the palms of his hands as it goes past him. A little farther along a young woman puts a sheet of money paper very carefully on the plate. This sheet is as it comes from the factory and the right size for printing eight notes. The plate, with its sheet of paper, moves on and passes under a spongy roller. Great pressure is applied. The paper is forced down into the sunken lines. It drinks up the ink there. It goes on to another woman worker who carefully lifts the printed sheet out and stacks it with its fellows. So are these wonderful engravings that appear on the backs of the notes transferred to the money paper.

The simple ceremony of printing the paper is, however, but a small part of this task that must be performed in such a way that it turns out a sort of printing that can be done by nobody else. It must be a master printing which defies all the world to reproduce it.

There is back of this printing, of course, the carefully engraved plates. There is back of it also that specially made paper with the silk fiber running through it, produced for the government in secret. The treatment of this paper during the whole course of printing is a matter of great care.

Counterfeiters would, of course, like to have

sheets of this paper on which to print notes that they try to pass. Because of this a careful record is kept of every sheet of this money paper from the time it leaves the factory until it appears in finished money.

As the printing approaches, money paper is checked out of its own vaults, the seals are broken, and it is delivered to those who prepare it for its ordeal.

BUREAU OF ENGRAVING AND PRINTING

This paper, the experts say, is very sensitive. Lay a sheet of it in the window for an hour on a bright day and measure it, they suggest, making a record of its length. Do the same thing on a damp day. The length is different. Subject this paper to hardship and it suffers, is weakened. Give it rest and it

regains its strength. These are facts that must be borne in mind during the printing.

Paper hates water. Have you ever seen a book that has been wet and has dried out? It seems to have writhed as in torture. Yet the first process through which this fine money paper must pass in preparation for the printing is a wetting process. When it gets to the press, to the moment when it is to be forced down in the depressions to drink up the ink that has been prepared for it, it must not be harsh and stiff. It must have just the right degree of sponginess, which the right amount of moisture gives it. Thus will it best serve its particular purpose.

So this precious paper goes first to the wetting machines. There it is taken up sheet by sheet and conveyed by a belt down into a trough where it is carefully ducked. It comes out and is put through a wringer just as are the clothes on washday. In its dampened condition it is counted, signed for, stacked up in piles as big as bales of cotton, and swathed in damp cloths. It must stand in this condition for several days so that the moisture will get all through it, so that all of it will be equally damp. It is in this condition that it appears for printing.

The experts say that this wetting is hard on the paper, that it exhausts it, weakens it. When it goes on the press it is put under terrific pressure. Its fibers are crushed, torn apart. After it is printed,

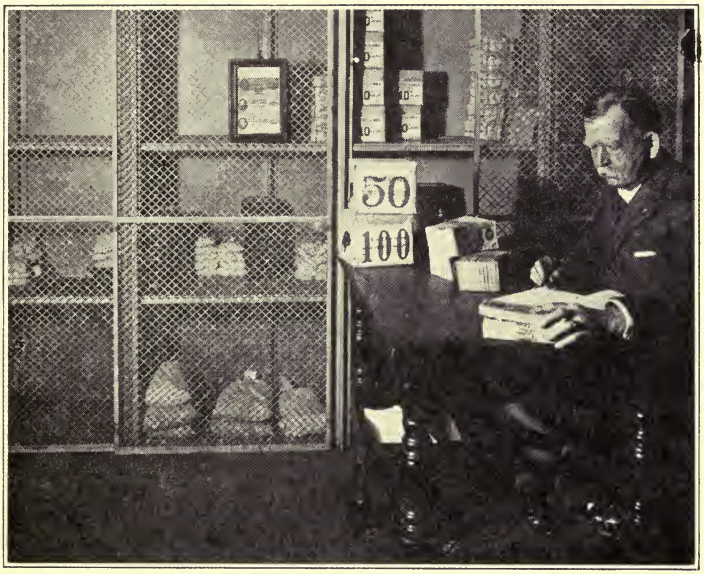
it is run on belts into a flue that is hot and passed slowly through it. Here it is quite thoroughly dried out. It is not so dry, however, but that it must be checked into drying rooms at night and roasted through those hours during which the rest of the world slumbers.

WETTING DOWN MONEY PAPER

It now goes to the examining room. At every stage of its advancement so far it has been clawed over by counters. Records have been made of the passing on its way of every sheet. It has already been counted a dozen times. Here in the examining room it must be counted and recounted. Highly skilled examiners must look at the printing it has so

far received and take out the sheets that are not perfect, carefully accounting for each.

The experts hold that the paper should, at this time, be given a rest. It should be placed on the shelves and allowed to season. They believe that,



THE FINISHED MONEY

lying here, the fiber in it relaxes, that it recovers from the wetting, the roasting, the hardship of the printing through which it has passed. They believe, also, that months are required for the ink properly to get hold of the paper.

It often happens that the call for finished notes is so great that there is not time to wait for the paper

to season. It must be hurried on for other processes of printing.

It must go again into the wetting machines. It must go again upon the press and get its face pressed down into the depressions of the plate. It must go again into the fiery furnace that its moisture may be dried up, into the drying rooms for nights of torture. It must be counted and recounted, examined, checked, and rechecked. Here again, when there is time, the paper is put on the shelf and allowed to rest, to age. If there is not time, as is often the case, it is hurried back to yet other machines that put on those numbers and those seals that appear on the face and are a different color from the other printing.

Every individual note that ever comes from the government printing office has a different number on it. This converts it into a note that is different from any other. The number on it may be quite big. It may run up to a hundred million. It never goes farther. When the printers get to a hundred million they begin a new series. One series of numbers may have M before it and B after it. When the machines get to a hundred million they begin a new series which may have an M before it and a C after it. That is a new series. It, too, will run to a hundred million.

If the Treasury grows suspicious of a bill that is presented for redemption, suspects that it may be a counterfeit, one of the tests is to look up the number

and see if a bill of that number has already been redeemed.

There are certain bills that are known as star bills. They have a star on them and a number that is quite

STAMPS ARE MADE IN THE MONEY PLANT

out of the series. It is interesting to watch for star bills. It is interesting to know what is back of them. Here is the story.

After these bills have gone all the way through the course of printing and have become individual, finished, numbered bills, they are again examined very carefully before they are allowed to go into circulation. If so much as a rust speck is found on any one of them, that bill is taken out. The whole

Where Paper Money Is Baled Like Hay for Shipment

series has already been numbered, however, and so it is necessary to put in a substitute for this disqualified bill that the record may be complete when redemptions are counted up. The star bills are substitutes. They are batting for players that have been taken out of the game.

The final process in making money is to give it a bath in "sizing." This sizing is a thin glue and the plan is to bind the note together with it, to heal its wounds, to cover it with a coating that will help keep out the water, the oil, the dirt, that will make it last longer. For years after the war the money was not given this final sizing. There was such a demand for paper that there was not time for it. The money, not having had time for aging was so "green," the ink was so fresh on it, that it would smear if it were sized. Sometimes even now it is not sized. If it is not it is inferior paper money.

Now the notes are finished. They must be counted again and a record made of their passing. Then they go to the last of those cruel machines that have punished them, a machine that jams them together with a terrific pressure, runs iron bands about them, fuses those bands together with an electric current. In this way packages from which it is impossible to take a single bill are made up. They cannot be opened and again sealed unless the meddler has one of these same machines. This is yet another protection thrown about the government's paper money in its journey through the factory. So at last the money is made ready for its final distribution.

CHAPTER XIX

PROTECTING THE CURRENCY

HAVING printed its notes and given them to the people to use as money, the government must, of course, keep everybody else from making other notes like them that might be used for the same purpose.

There have been many people who have tried to counterfeit the government's money. None of them has ever succeeded in doing it so well that he has not been caught. Most of them have had plenty of time to regret their folly while serving long terms in prison.

The Treasury Department at Washington maintains a bureau known as the Secret Service, whose chief duty is to protect the money. It is made up of men who are experts on money and wise as to the methods of counterfeiters. There are members of the Secret Service in all parts of the country. Whenever and wherever a counterfeit note appears these men get on its trail like bloodhounds and trace it back to its source.

We have already studied the infinite care with which the steel plates are engraved. It is plain

that it would require a master engraver to reproduce one of these plates. Yet, in the old days, attempts were sometimes made to do just this. The engravings in those days were not so difficult as they are now. In those days also there were more steel engravers.

Steel engraving is an old-fashioned method by which pictures are reproduced. Fifty years ago many men were working at it. There were many men who could make high-class steel engravings. Of these some one now and again would try to make a quick fortune by counterfeiting. The notes that such an engraver made were among the hardest to detect that have ever been put out.

Then photographic methods of printing pictures were developed. It was so much easier and cheaper to produce them in this way that people no longer used the steel engraving method. There was no longer any call for that sort of work. As a result men stopped learning how to engrave on steel. To-day the only call for steel engravers is in the plants where money is made. Men who learned the art there do not leave their work, for there are no jobs for them on the outside. There are but a few steel engravers in the United States and the Secret Service knows every one of them. If a steel-engraved counterfeit should appear, the Secret Service would know that some one of these men had made it. There would be little trouble in tracing it to the maker.

THIS VIEW IS FROM THE WINDOW OF THE CHIEF OF THE SECRET SERVICE

The modern method of making counterfeits is to use a good camera. A photographic plate of the note to be counterfeited is made. But the counterfeiter does not print his picture on a piece of paper. Instead he prepares a steel plate for it. This steel plate is covered with a sort of wax on which the picture may be printed and developed. It is printed and developed on the outside of this sheet of wax.

The counterfeiter then cuts out the lines of the engraving in the wax. Then he puts this steel plate with the engraving in the wax in a bath of acid. The acid eats into the steel where the wax has been cut away but does not affect the wax. The steel plate is now etched. Lines are eaten out that will hold the ink for the printing.

But this method makes a rather poor imitation after all. In photographing the note much detail is lost. Anybody who has copied photographs knows this. The finely shaded background of the picture which was grayish reappears a solid black. The minute detail in the fabric of the coat, for instance, is lost. The light points of the picture become lighter and the dark parts darker with photographing. This is a fact of rephotographing with which even the amateur is familiar. There is no escape from it. In the etching also the acid bites into the steel to equal depth everywhere.

The mastery of steel engraving is that the picture may be made to stand out from the paper. This is

the result of the varying depth of the cuts made in the steel with the graver. It cannot be procured otherwise. The photographic reproduction loses this. It looks flat. The difference can be seen by anybody who examines the result. The face of the bill of the photographic process cannot be made to look like that printed from a steel engraving.

The Secret Service organization would like every citizen to take note of the peculiar qualities of the portrait engraved on each of the bills. It believes that every one should get the appearance of these portraits firmly fixed in his mind. If he does so he will come to be able to detect a counterfeit when he sees it. It is bound to have a different look. It is so different from the genuine that the average person who has given a little time to the study of the portraits on the money will, when he looks at them, feel that there is something wrong with bills that have been made from photographs.

Right here appears one of the greatest faults in the currency system of the United States. The designs on the notes have no logical reason for being what they are. There are from four to six designs of notes of each denomination. All ten-dollar bills, for example, are not alike. There are, in fact, five quite different kinds of ten-dollar bills. Some ten-dollar bills have the face of William McKinley, some the face of Andrew Jackson. Some carry the portrait of T. A. Hendricks and some the face of Michael

Hillegas. Some have no face at all, despite the fact that the reproduction of a portrait is the hardest thing that a counterfeiter can be given to do. The United States notes carry the picture of a buffalo instead.

There are so many types of ten-dollar bills that the public becomes confused by them. The same is true of the other denominations. The average user of money never comes to be sure what he should expect in any of his money. He might make up his mind, for example, that the portrait of Washington stands for the one-dollar bill. Then, much to his surprise, he would find Washington on a two-dollar note, and again on a twenty-dollar note. It is all very confusing.

Along the way there have, of course, been occasional counterfeiting geniuses who have struck out for themselves and made counterfeits in their own peculiar way. The greatest of these undoubtedly was Jim the Penman, an old German, who painstakingly copied the faces of notes with pen and ink on pieces of blank paper, working out the infinite detail so completely that he succeeded for a time in passing them. His genius was such, of course, that he could have made much more money working honestly.

Jim the Penman got his idea from a big picture of some bit of currency, done with pen and ink, which he saw hanging on a wall in New Orleans. He thought that he could do a better job. That night he

began making a drawing in pen and ink of a bill, natural size. He did so well that, when it was done, he passed it as money. He was so successful in this that he started on a career of crime.

Finally, he came to New York with a package of these bills. He passed one of them in a restaurant. When the cashier gave him his change her fingers were wet. The bill she received smeared with moisture. A runner was sent to follow Jim. He was seen to stop at every cigar store he came to, to buy cigars and give one of these hand-made bills in payment. He had passed half a dozen of them before he was arrested by a Secret Service man. He served a long term in prison, came out, and thereafter lived honestly.

CHAPTER XX

CHECKS AS MONEY

IT has been a long journey from the copper pot to the currency put out by the Federal Reserve System.

In this final money, which man has worked out after three thousand years of trying, it would seem that he had found a help to business that serves its purpose almost exactly as it should.

The development of money has been very much like the development of other handy devices with which man has surrounded himself. It has been like the development of the automobile.

That machine had its start when, back in the dawn of civilization, some savage put a stick through the hollow of a piece of log and discovered the principle of the wheel. It made a great step forward when the Abyssinians put those wooden wheels on their battle chariots. Then it made another step when some one had the fantastic idea of setting off gas inside a band of steel and harnessing the explosion.

Yet nobody seems to be willing to stop with the automobile as it is to-day. Men still go on trying to make it better.

So it is with money. Handy as it is now, new ways are being found to carry on business without using the actual money but slips of paper which stand for it. During the last hundred years a scheme has been worked out that handles the greater part of the business of the world without the use of actual money.

Back of this scheme is the bank, and the tool it uses is a slip of paper called a check on which men make a few marks. If the marks are made in the right way by a person who is entitled to make them the check becomes the same as money. Back of the check there is always actual money. A bank is a place to put actual money for safe-keeping and the check is the device for taking it out as wanted. There must always be money back of the check.

By writing these checks, under the proper circumstances, men can manufacture a new sort of money all their own.

And now that the world has got used to checks it wonders, when it stops to think, how it ever got on without them.

It is interesting to try to put one's finger on the incident in history which led to the building of so big an agency as the banking system as it exists to-day in the United States.

Our system, as a matter of fact, ties back to that of England. If one examines the records, however, he will find that there was no such thing as a bank in London in Shakespeare's time. There were no banks

at the time Virginia first began sending tobacco back to the mother country, or Massachusetts began to buy her meager supplies.

There were no banks in 1640. Yet the merchants of London were at that time quite prosperous and were likely to find that they sometimes had large amounts of cash or bullion in their stores. They had no great vaults in which to keep this money safe. The streets were dark and none too well guarded. They worried a good deal for fear of being robbed.

So they took their treasure within the beetling walls of the Tower of London where Sir Walter Raleigh had spent many recent years in prison and where he had been executed. It was there the government's mint was stationed. Here the treasures of the merchants were left for safe-keeping. Receipts were issued to them in the name of the king.

Then, in 1640, Charles I, who was then on the throne, had trouble with Parliament. He dissolved that body and brought its meetings to a close.

But when it was gone he found himself in a very tight place. He had adjourned Parliament before it had voted money for carrying on the government. He had no money even for current supplies or salaries.

In this time of need the king thought of the money that the merchants had left in the Tower. He promptly seized it and used it for carrying on the government.

As a matter of fact the merchants lost nothing, for their money was later returned to them. The idea of leaving it in the Tower was not popular after that, however, and they began looking for some other way of keeping it safe. The goldsmiths, they found, had strong boxes and many people took their jewels and other valuables to them for safe-keeping. The merchants began taking their money to the goldsmiths.

Soon the goldsmiths found that they could loan out this money at a profit. They began giving the merchants a bit of interest on their deposits, loaning them at a higher rate. In this way they had discovered a new business.

Two or three hundred years earlier certain Jews of Lombardy, in Italy, living in different towns, had come to a business understanding. One of them would write a letter to another asking him to pay an amount of money to some third person. The second would do so. This would save the first one from having to send coin all that distance. Sending money about in those days was a dangerous business because of the abundance of robbers. Maybe, the next week, the second Jew would need to pay money to somebody in the first Jew's town. He would do it by writing a letter to the first Jew. Their accounts would balance and no money would have been sent about where it would not be safe.

These letters served the purposes of checks. The

idea of using some such scheme as this gradually grew in the world during this period. In London the merchants began writing such letters to the goldsmiths. These letters would tell the goldsmiths to pay certain amounts of money to certain other persons. They became briefer and briefer until they finally took the form of the check of the present day.

People found out that it was often handier, when they had money, to send it to the goldsmith who later became the bank and, when they wanted to make a payment, write one of these orders to the banker than it was to pay in actual money. The person receiving the check usually took it to his own goldsmith or bank and deposited it. Thus a debt was paid and money transferred from one bank to another by merely writing one of these orders. Other banks than those on which the checks were drawn found that they could accept these checks as money if they knew that the person presenting them was honest and had funds. So properly indorsed checks came to be passed around quite freely. They took the place of money. Any bank would accept them. They had but to be presented to the bank on whom they were drawn to be turned into money.

Yet, even so, the check was used almost not at all at as late a period as the Revolutionary War. It was about the year 1800 that its possibilities began to be understood. It took fifty years more for it to come into general use. Even at the time of the Civil War

it was no uncommon thing for a gentleman of means to take his bags of gold and silver in his carriage and drive about the town paying his debts in clinking coin.

Nowadays, all banks cash checks for their customers or receive them on deposit. Many of these may be checks drawn on other banks. Those checks must be presented to the banks on which they are drawn. All the banks in New York used to employ runners to present these checks and bring the money back. Each of the other banks had messengers who brought checks to them to be cashed. All of this was a great deal of trouble to the banks, and slowed up business.

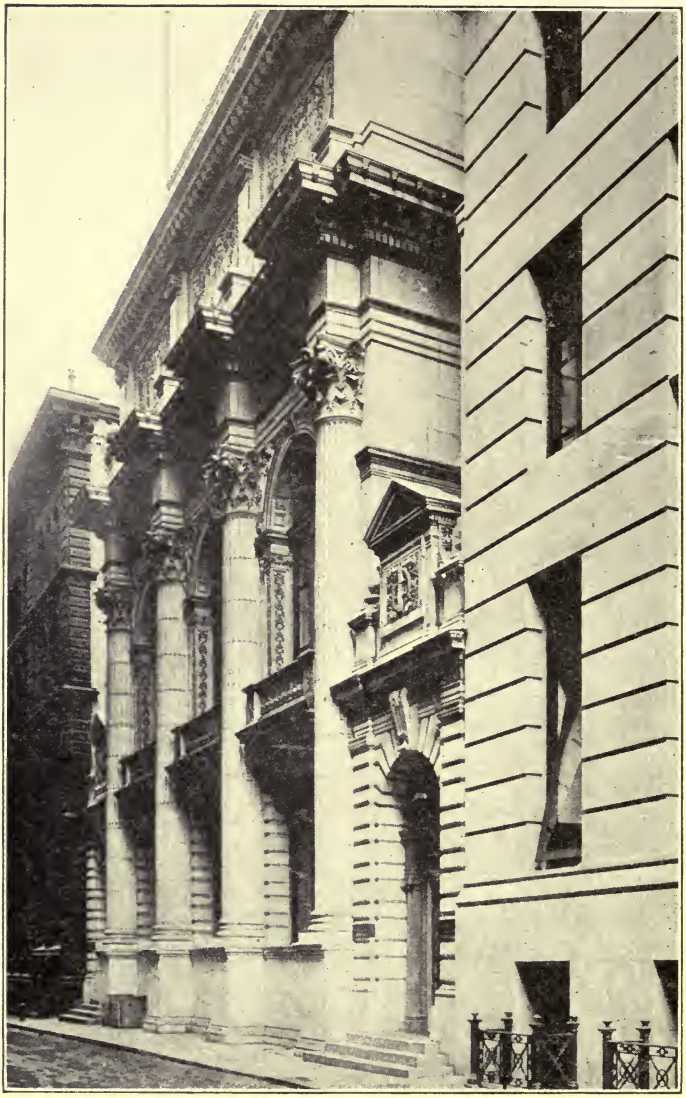
It probably happened on some hot summer day that a runner of bank number one, on his way to bank number two, met the boy from that bank half way. The two of them found that they could exchange checks there on the sidewalk and that each would save half his journey. Anyway, it is a fact that by 1853 groups of these runners had the habit of meeting at a certain hour on a certain corner of Wall Street and exchanging checks. This saved each of them the trouble of going around to all the banks.

The clearing house system of the banking world grew out of this meeting of runners. All the checks of all the banks of a great city like New York go to the clearing house every day. The clearing house straightens out the tangle of these checks and charges

are made on the books of the different banks. The checks of bank number one that have come into bank number two are charged up against it. The checks of bank number two against bank number one are entered. All the checks of all the banks are properly charged. Balances are struck. Maybe the amounts are near the same figure. Little money has to change hands. All the banks have credit with the clearing house. The adjustments are made by entries in books. They are made every day. It is all very easy. No runners are needed. No money need be sent from bank to bank. The relations between banks in all the larger cities are now handled through the clearing houses.

This development of the clearing house led to a great increase in the use of checks as money. The public gradually grew to use checks for such purposes as paying the rent and the grocery bill. If one kept his account at a bank, that bank might loan the money to somebody else while its owner was not using it and get interest on it. With a great number of depositors there was always money in the bank that might be loaned out in this way. In exchange for the money it made out of this loan business the bank was willing to perform such services for its customers as keeping their money safe and taking care of their checks.

The check worked very handily for paying the debts one owed in the community in which he lived.



NEW YORK CLEARING HOUSE

Often, however, he might want to pay for something he had ordered from another place. He might be a merchant in Kansas, and might be buying drugs in Baltimore and suits of clothes in New York. It used to be that he must pay such bills as these in drafts which he would buy at the bank in his own town against banks in the town in which his creditors lived. He had to pay the amount of his bill for these drafts and in addition a fee to cover the trouble taken by the banks in adjusting their balances to cover this transaction. Sometimes he might use a check, but the machinery for its collection was complicated and a charge was often made. Checks could not be used as money for their face value in making these payments as they could between two people living in the same community.

But when the Federal Reserve System was established in 1913 by the national government a way was thought out to make checks worth their face value even when the two parties interested were in cities that were far apart. A man in New York, for example, might owe one hundred dollars to a man in San Francisco. The Federal Reserve System worked out a scheme for check collection. Under it he could write out an ordinary check for just the amount of his debt on his own bank in New York. He could put it in the mail and send it to the San Francisco man. That individual could go to his own bank and deposit the check. He would be given credit for the

full amount, one hundred dollars. There were no deductions, no charges for collection.

These two men, living in cities far apart, each known by his own bank to be responsible, could make their own money with which to pay their debts to each other. It was better money for the purpose than would be yellow-backed bills printed by the government. It was better because, if it was lost or stolen in the mails, no third person would be able to use it as he would a hundred-dollar bill. It could be cashed only by the person to whom the check was made out.

The Federal Reserve System is able to "clear" all these checks without great expense because it has branches in all parts of the country. These branches have established credits with the System. The balances can be adjusted merely by making entries in books. It is not necessary to send money back and forth. The collection system of the Federal Reserve banks does for the nation much the same thing that the clearing house does for the individual cities.

All of this has made the use of checks as money handier and handier all the time. The use of checks has steadily increased, particularly since the clearing house was established. It is estimated now that ninety or ninety-five per cent of the business of the nation is carried on by the use of checks. Every time, in the nation, one dollar is paid in actual cash, nine are paid by check. Of course there are a great

many transactions in actual cash. The small buying is done in cash. But when men come to make payments of considerable size they take out their check books and make scratches on them with pen and ink. So in the last hundred years men have found a way to put their actual money in the bank and use orders on it rather than handle the actual money itself. Bookkeeping has largely taken the place of the old business of paying debts by moving money from one place to another. A way has been found to make money do its work without taking anything out of the bank.